"I can live with this"
The Bay of Plenty Regional Council public engagement on acceptable risk

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GLOSSARY OF TERMS

BOPRC	Bay of Plenty Regional Council
CDEM	Civil Defence Emergency Management
IAP2	International Association of Public Participation
PRPS	Proposed Regional Policy Statement
RBPA	Risk-based planning approach
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
TCC	Tauranga City Council
WBOPDC	Western Bay of Plenty District Council
WDC	Whakatane District Council

KEYWORDS

Risk, natural hazards, public engagement, land use planning, Bay of Plenty

EXECUTIVE SUMMARY

Land use planning that takes into account natural hazard risk requires a value judgement over what is deemed an acceptable or unacceptable level of risk. It correspondingly needs avenues for the deliberative processes involved in making this value judgement and for including input from affected communities who live with the consequences of the risk decisions. However, talking to people about a risk they might face in the future, as a result of decisions they make in the present, is notoriously hard; even when the consequences are quite apparent. Talking to entire communities about the risks of natural hazard events can seem almost impossible.

Nevertheless, the world we live in is changing, and talking to individuals and communities about future risk from greater and more dramatic storm and flood events, sea level rise, coastal erosion and other natural hazards is something that local government agencies have to do more and more. In this report, we look at the way one local government agency, the Bay of Plenty Regional Council (BOPRC), took-on the challenge of including the views of their local community in deciding where the threshold for acceptable risk lay.

In October 2013 the BOPRC began work on a variation to the natural hazards component of the proposed Regional Policy Statement (PRPS)[1]. The BOPRC were interested in providing a framework within the RPS that would support risk-based planning in the Bay of Plenty and pending legislation and proposed Resource Management Act 1991 (RMA) amendments affirmed this direction. Key to a risk based approach to land use planning is the delineation of the thresholds of acceptable, tolerable and intolerable risk. The BOPRC took the position that this determination of risk acceptability required public input. A work stream was initiated to facilitate community and stakeholder involvement in the regional planning process specifically around the question of what was acceptable, tolerable or intolerable natural hazard risk.

The resulting project ran from January 2014 until May 2014. Termed "I can live with this risk", it was an innovative approach to public engagement on a difficult topic. The process met the BOPRC need to get a feeling[2] for community views on natural hazard risk; engaged the public imagination; and produced a robust response that could be evaluated alongside technical input on risk thresholds and integrated into the final decisions in Variation 2 (natural hazards) of the BOPRC PRPS[3]. Several key points contributed to this.

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[1] The report refers throughout to Variation 2 (natural hazards) to the proposed regional policy statement of the Bay of Plenty Regional Council. However in October 2014, this was amended to "Change 2" to the (now operative) Regional Policy Statement. At the time of publication the BOPRC had received and heard submissions on the RPS.

[2] This was the goal expressed by the combined regional council and territorial authorities meeting at the start of the engagement process in January 2014.

[3] Decisions" on incorporation of the risk thresholds have occurred at several stages: on 15 May 2014 when a BOPRC committee received the report on the Risk Threshold Engagement and adopted its risk thresholds; and on 28 August 2014 when the Council adopted Proposed Change 2 (incorporating the risk thresholds) and approved its notification for submissions. Two further decision stages – decisions on submissions and approval before making Change 2 operative – had not been reached at the time of publication.

1. The process was based on good public engagement practice (as recommended by such authorities as IAP2[4] and guidance from Quality Planning[5]). It was also specifically designed to meet some of the unique challenges of communication on risk, particularly the need for engagement processes that:

    -   build capacity for judgment by providing a means for people to understand complex risk concepts; consider the implications for themselves and their community; and enable them to realistically reflect on both the consequences and likelihood of natural hazard events before making decisions about risk acceptability, and

    -   link judgements on risk acceptability to implications for local government policy or action.

2. Core elements of the process were:

    -   Good interdisciplinary collaboration, particularly the initial project scoping workshop which combined skills from planning and policy, community development, Māori liaison and communication from regional, city and district agencies;

    -   Use of the risk based planning framework and the resources provided in the Risk Based Planning Approach (RBPA) toolkit from GNS Science (http://gns.cri.nz/Home/RBP/Risk-based-planning).

    -   Design of community sessions that combined the semi-structured approach of focus group methodology with public meeting design and took people through a five step process of developing understanding and making judgments;

    -   The use of the "I can live this" scenario matrix to capture participants views on risk acceptability across all natural hazards and enable them to consider both the likelihood and consequences of events in making their judgements;

    -   Careful and sensitive analysis of the participant's responses, utilising all the feedback from the meetings to generate a summary overview of community views on risk thresholds;

    -   A four step process to review and compare the community response with other technical views on risk thresholds; and give clarity to how judgement calls were made; and

    -   This was an adaptive approach and there was opportunity for the project team to reflect on the process, and amend where necessary.

Overall, the BOPRC public engagement on risk was a robust contribution to the development of policy. It met criteria for valid process, valid interpretation, and valid and transparent integration into the final decision. It produced new insight beyond the limits of traditional consultation over policy alternatives. Moreover, it facilitated public and stakeholder input into an early stage of the policy planning process – contributing to the development of the decision.

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[4] IAP2 is the International Association for Public Participation. It advocates for improved practice and supports professional development. It is widely recognised for its work and many local government agencies in New Zealand recognise this as an important resource.

[5] The Quality Planning website promotes good practice by sharing knowledge about all aspects of practice under the RMA. It is the primary tool for delivering robust information on RMA processes and environmental policy to resource management practitioners (http://www.qualityplanning.org.nz/)

1.0 INTRODUCTION

'Statistically speaking, there is a far greater chance of being run over by a motor boat than being eaten by a shark. The reality, though, is no one will ever make a movie called `Propeller'

Kirk Smith, Professor of Global Environmental Health, University of California, Berkley (attributed)

Talking to people about a risk they might face in the future, as a result of decisions they make in the present, is notoriously hard; even when the consequences are quite apparent. As the quote above indicates, people can have odd ideas about risk; often fearing things that are unlikely to happen while ignoring those that could genuinely impact on their lives.

Talking to entire communities about the risks of natural hazard events can seem almost impossible. Most of us, unless we have direct and recent experience of natural hazard disasters, simply lack the language and tools to imagine all the ways these could affect us. Natural hazard events can seem a low priority amongst the concerns we face every day.

However, the world we live in is changing, and talking about future risk from greater and more dramatic storm and flood events, sea level rise, coastal erosion and other natural hazards is something that local government agencies have to do more and more. This report is designed to help local government agencies manage some of the challenges of talking to communities about natural hazard risk as part of making plans and policies for future land use. This is particularly pertinent as agencies respond to recent events such as the Canterbury earthquakes, as well as impending changes to the Resource Management Act (Ministry for the Environment, 2013a, 2013b), and face questions internally and externally about how to more effectively incorporate natural hazard management into land use planning (LGNZ, 2014).

In this report we look at the way one local government agency, the Bay of Plenty Regional Council (BOPRC), took-on the challenge of including the views of their local community in deciding where to draw the line on acceptable risk. This report presents this experience of public engagement on acceptable levels of risk from the Bay of Plenty, and distils lessons and opportunities for other councils looking to apply a risk-based approach to land use planning for natural hazards.

The information in this report comes from two convergent initiatives involving the authors. The first was the 2012–2013 Envirolink[6] project on risk based planning, involving GNS Science and local and central government partners. This project was aimed at providing guidance for district councils seeking to move towards a risk based approach to planning. The resulting report and online toolkit included ideas about how risk can be assessed based on a more thorough analysis of the consequences of events (Saunders et al. 2013, online toolkit: http://gns.cri.nz/Home/RBP/Risk-based-planning). This enhanced consequence assessment adds to traditional metrics of natural hazard impact such as life-loss and injury, and includes ways to incorporate measurements of cultural and socio-economic impact as well as impact on the built environment and critical infrastructure.

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[6] Envirolink is a Regional Council driven fund designed to support translation of research to practice in local government environmental management. It is administered by the Ministry for Business, Innovation & Employment – Science & Innovation.

This risk-based planning approach (RBPA) provides a framework for categorising risk as (for example) *acceptable*, *tolerable* or *intolerable*. However, the actual acceptability, or otherwise, of natural hazard risk is still a matter of judgement. In line with international best practice and emerging practice in New Zealand (LGNZ 2014), Saunders et al. (2013) emphasise that such decisions are not the province of technical experts alone. Rather it is both important and useful to the decision making process to include the viewpoints of the communities whose life and livelihoods are most affected by the decision.

The second project was the 2014 BOPRC public engagement on acceptable risk –*"I can live with this*". The BOPRC was represented on the steering group for the RBPA Envirolink project. The timing of this coincided with the BOPRC's own need for a supportive risk analysis framework on which to base proposed changes to the natural hazards component of the proposed regional policy statement (PRPS). In particular, BOPRC wanted to extend the analysis of natural hazard impacts beyond current provisions, which relied on mortality indicators and to take a risk-based approach to land use policy. As part of this they hoped to find a valid mechanism to assess the regional community's tolerance to natural hazard risk. BOPRC initiated a work stream for facilitating community and stakeholder involvement in the regional planning process, specifically around the question of what was a tolerable or intolerable natural hazard risk (BOPRC 2014b). The intention was that public input would be integrated alongside technical risk threshold assessments provided by internal and external expertise. The authors provided direct input into this initiative, in particular Margaret Kilvington was the external consultant involved in the design of the approach.

This report has five key sections:

Section 2 introduces the challenges associated with talking to communities about natural hazard risk, the issues facing local government agencies in NZ. Section 2 also summarises current ideas and international best practice around natural hazard risk engagement.

Section 3 outlines and reviews the community engagement process used by the Bay of Plenty Regional Council as part of its preparation of the 2014 variation of the natural hazards section of the Regional Policy Statement.

Section 4 assesses the validity and robustness of the BOPRC public engagement process.

Section 5 provides an example of the opportunities that exist in the Wellington region for a similar approach to be applied.

Section 6 provides conclusions and a summary of key points.

2.0   THE CHALLENGE OF TALKING TO COMMUNITIES ABOUT RISK

Land use planning that takes into account natural hazard risk requires a value judgement over what is deemed an acceptable or unacceptable risk. It correspondingly needs avenues for the deliberative processes involved in making this value judgement (Pidgeon & Gregory, 2004) and for including input from affected communities who live with the consequences of the risk decisions (Renn, 1999). Internationally, there is a strong movement towards participatory risk assessment – using communication and engagement activities that increase the capacity for public deliberation in natural hazard management (Godschalk et al., 2003, Boholm et al., 2013). A recent report by New Zealand Local Government Association (2014, p. 28) notes:

> *When collective management of risk is required, those collective management decisions should be made closest to the community most affected by the risk.*

The role of stakeholders has been highlighted in the Sendai Framework for Disaster Risk Reduction 2015–2030 (of which New Zealand is a signatory), where reducing risks is a shared responsibility between governments and relevant stakeholders at local, regional and national levels (United Nations, 2015). This has implications for the existing practices of New Zealand local government agencies; particularly when and how to include stakeholders and communities in the decision-making process.

The rationale for public participation in judgements about risk are numerous. Foremost is that consultation is part of the democratic basis of local government internationally and in New Zealand; i.e., when people's lives, livelihoods and values are affected by local government planning and policy activities they (i.e., the public) should have the opportunity to take part in the decisions (LGNZ, 2014, Forester, 1999; Corburn, 2005; McKinlay Douglas, 2009). Greater public engagement is also proposed as a way of reducing conflicts, as there is potential for these conflicts to be exposed early and for dispute resolution to be built into a participatory process (Godschalk et al., 2003, Fischhoff, 1995). Increasing stakeholder input can be a way of ensuring the social impacts of resource use and natural hazard risk decisions are identified and attended to (Höppner et al., 2010) and a better, more implementable plan, can be generated (Burby, 2003). Moreover, lay knowledge and direct contextual experience is increasingly sought-after in making these judgments, as scientific organisations and regulatory agencies are no longer regarded as the only source of relevant information and expertise, or the only arbitrator of what is to be considered relevant (Duncan, 2013; Weber et al., 2011).

However, despite overall trends towards more participatory modes of local governance in New Zealand, there is no consistency in the treatment of ideas around community, participation, stakeholders, collaboration, or engagement outside of statutory consultation protocols defined through the Resource Management Act.

In the face of limited experience of the different ways in which the public can be included in natural hazard risk decisions, land use planners and policy makers can hold some understandable fears. Chief amongst these is the idea that involving the public will lead to 'bad outcomes', where decisions would be made to accept levels of risk that are very high. This would increase future communities' vulnerability to natural hazard events, and lead to a long term increase in local government liabilities. Local government officials spoken to during the development of the RBPA made reference to difficulties in conveying concepts such as risk, likelihood, or return periods; and in adequately conveying hazard impacts, or the importance of

planning for long term outcomes. There was often a degree of cynicism about people's abilities to consider long term matters, or think beyond their own personal concerns, or even to be interested in such discussions without a personal and immediate stake in the decision.

There are also concerns about the practicalities of public engagement on risk. Such processes: (i) can be lengthy, require a long lead-in time and may not match planning timelines or public expectations for decisions; (ii) may increase insecurity by revealing knowledge gaps and uncertainties (Wachinger & Renn, 2010); or (iii) blur the line between facts and values in risk assessment – hence the objectivity of decisions can be questioned, and the decision-making process discredited (Treffny & Beilin, 2011).

Engagement process design challenges include: (i) managing the tension between raising unnecessary alarm and disinterest; (ii) taking into account different scales of local government, operations, diversity of communities, and their preferences for engagement (including tangata whenua[7]); and iii) creating meaningful data that can be incorporated in a decision-making process alongside technical input.

Another important context for New Zealand local government agencies is the separation, and oftentimes limited interactions, between expertise groups – particularly between planning and policy, Civil Defence Emergency Management (CDEM), and community engagement staff. Participatory risk assessment is an inter-disciplinary effort leaning on capability beyond technical hazard science and planning understanding. It includes those with experience in communication and community interaction and hazard emergency management, as well as good knowledge of the local issues.

In planning public engagement activities around natural hazard risk it is important to pay attention to the difficulties and concerns faced by local government land use planners and policy makers. Authors such as Wesselink et al. (2011) identify poor consideration of the real operative context of local government as a reason for lack of progress internationally in entrenching participatory risk assessment processes in policy and planning decision-making practice. In New Zealand, RMA case law and the overturning of local government decisions through the Environment Court loom large in the influences on local land use planners. Local government agencies want public engagement processes that contribute to planning or policy outcomes that are rigorous enough to withstand legal contestation. One of the areas where land use planning decisions by local government have proved susceptible to Environment Court challenge is the question of 'acceptable risk' (Saunders, 2012). It is therefore important that communication and engagement activities help to contribute to the robustness of land use policy and planning decisions.

Fundamentally, processes of public engagement on natural hazard risk need to be right for the context of the decision. While there is a view of participatory risk management that advocates consensus based decision-making involving a wide range of stakeholders with significant interests (McDaniels et al., 1999), this is not the only option, nor is it always practical. Where there are scales of operation or resource limitations that make consensus based decision-making difficult, it is not necessary to abandon alltogether the idea of participatory risk-based planning. Providing an extension of statutory public participation, through formally structured opportunities to contribute to value judgements on risk, is still exceedingly benificial (as we will demonstrate in this report) and may be more feasible.

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[7] Tangata whenua is a Māori term of the indigenous peoples of New Zealand and literally means "people of the land", from tangata, 'people' and whenua 'land'.

Summary of important aspects to public engagement on risk

A review of international literature and practice on risk communication and consideration of the unique context of local government in New Zealand indicates the following features are important to consider in designing a process of engagement on risk (Saunders et al., 2013).

Key elements of risk engagement for land use planning include:

- building capacity for judgment, by providing a means for people to understand complex risk concepts and consider the implications for themselves and their community. In particular enable them to realistically consider both consequence and likelihood in making decisions about risk acceptability.

- linking judgements on risk acceptability with implications for local government policy or action.

- facilitating public and stakeholder input into different stages of the planning process, including: i)contributing to knowledge about the local context of the hazards and risk, ii) development of policy and management options, and iii) assessment of residual risk.

- enabling public and stakeholder input to be considered alongside technical expertise.

Key tasks of risk engagement for land use planning include:

- considering what is known about current risk sensitivities or public awareness of risk and how to manage high public concern or poor awareness (Sandman, 2003).

- considering and planning for important context and history – such as previous experiences with natural hazard events.

- assessing all relevant stakeholders and how to incorporate or represent their views, particularly where these are unlikely to come from broad scale public input.

- matching processes to the different engagement preferences of different stakeholders and communities and the unique requirements of tangata whenua.

- having a plan for how the feedback received will be integrated into decisions made.

Good processes, guidelines and principles also suitable for application to risk engagement activities are available through the IAP2 (http://www.iap2.org/), and the Quality Planning website (http://www.qualityplanning.org.nz/index.php/component/content/article/42-communication/118-guidance-note).

Furthermore, since hazard management is a cross-boundary, regional and even national scale issue – involving the expertise of planners, policy makers, technical, communication and emergency management specialists – good risk based planning and associated engagement activities are best supported by cross agency and cross expertise teams.

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3.0   GETTING TO ACCEPTABLE RISK: THE BOPRC PROCESS

In 2010 the BOPRC notified a second generation PRPS. Submissions were received, heard and decided on but some issues remained unresolved. A working party, including some of the major appellants, established under the Environment Court, met to review subsequent appeals on the natural hazard decisions. The appellants and the council agreed that rather than addressing concerns piecemeal, a new approach was clearly required. At the same time mounting awareness of the inadequacies of current mechanisms to manage natural hazard risks at the district level had persuaded BOPRC that a risk-based framework was necessary with the RPS. Furthermore the additional detail required for subsequent implementation was beyond the range of solutions available to the Environment Court to resolve the appeals. All parties agreed that a variation replacing the natural hazards provisions in the PRPS, with more detail on the risk management approach, was the most useful way forward. There was an adjournment in the RPS process for one year (from 31 October 2013), to allow for a variation to be prepared.

As noted in the BOPRC PRPS technical working group report:

> *Current and historic land use planning policies and decisions are based around the likelihood of a hazard occurring or a subjective assessment as to the "acceptable" level of risk and/or effect. These policies and decisions have arguably failed with respect to reducing risks to communities, infrastructure and resources. In some cases the risk has actually been increased either through the under-estimation of the extent of the hazard or through increased development within areas affected by the hazard. (BOPRC, 2014(a), p. 4).*

Central Government's decision to consider changes to the RMA to provide for more effective land use planning (Ministry for the Environment, 2013a, 2013b), affirmed the BOPRC in its decision to adopt a risk-based approach to land use planning in the natural hazards section of the PRPS.

BOPRC sought the involvement of the territorial authorities of the Bay of Plenty region in the natural hazards variation to the PRPS, as well as CDEM expertise and specialist policy and technical consultants. It also saw the importance of involving stakeholders who had previously indicated an interest in natural hazards policy. This need for cross institution, diverse expertise, and connection with stakeholders was expressed in the makeup of the project working groups comprising the project team, the stakeholder reference group, and the natural hazards technical working group (Table 1).

Table 1   Working groups of the BOPRC PRPS Variation 2 (natural hazards) project.

• Project team – *representatives of the region's city and district councils and the CDEM Office.*
• Stakeholder reference group – *agencies that submitted on the natural hazard provisions of the PRPS after it was publicly notified in November 2010.*
• Natural hazards technical working group – *BOPRC planning and technical staff, as well as expertise from GNS Science, Coffey Geotechnical, Tonkin & Taylor and Aurecon*
• Risk threshold engagement team – *external consultants, internal communications, community development and Māori liaison from district and regional council.*

A natural hazards technical working group was established when a review of current industry best practices and provision of Acts revealed how disjointed these were; making it problematic to use current best practice and legislative provisions as a foundation for the development of the PRPS. The group of specialists was assembled to explore a number of issues related to the risk assessment framework (BOPRC, 2014a). The technical working group met at an initial workshop in February 2014 and completed their work over the following month. Their task, under Work stream B (Table 2), was to review fundamental assumptions in current risk analysis for the range of hazards planned for under the PRPS. The natural hazards technical working group also considered existing standard likelihood measures, and consistency with planning timeframes. Their recommendations included the range of likelihoods for each hazard and commentary on the suitability of applying a risk-based approach.

Table 2   Work streams of the BOPRC PRPS natural hazards variation project.

a. Risk Threshold Engagement: *Public participation in the setting of risk levels and thresholds.*

b. Consistent Risk Assessment: *Development of a consistent approach to risk assessment across the range of natural hazards.*

c. Policy Framework Development: *Establishment of a policy framework that guides the management of land use and associated activities according to the level of natural hazard risk they are subject to.*

d. Implementation Guidance: *Preparation of guidance for the practical implementation of the policy through regional, city and district plans and applications for resource consent.*

e. Process Compliance: *Compliance with the RMA's prescribed process for the preparation of a variation (e.g., section 32) and any relevant provisions in the Local Government Act 2002.*

Key to the risk based approach to land use planning is the delineation of the margins of acceptable, tolerable and intolerable risk. The BOPRC took the position that this determination of risk acceptability required public input. Work stream A was initiated to facilitate community and stakeholder involvement in the regional planning process specifically around the question of what was a tolerable or intolerable natural hazard risk. A risk-threshold- engagement team of external consultants, and internal expertise in communications, community development and Māori liaison from district and regional council came together to work on Work stream A. This group fed directly back to the project team of the overall PRPS Variation (2) project.

3.1 "I CAN LIVE WITH THIS": PUBLIC ENGAGEMENT ON ACCEPTABLE RISK

The ultimate aims of the BOPRC RPS community engagement project (Work Stream A) were to gain peoples' input into:

1. what level of risk they want their community to be safeguarded from; and

2. when can the risk of a natural hazard event be regarded as acceptable, tolerable or intolerable (BOPRC, 2014b).

This is fundamentally a process of public participation in policy development. The intention was that the project would identify key themes in regards to the community's perception of risk and risk tolerance, and that public input would be integrated alongside technical risk threshold assessments provided by internal and external expertise. The engagement activities were also an opportunity to advise the community of the process for the variation, subsequent district and city council planning processes, and any future opportunities for input.

The project had five stages (Table 3): i) an initial workshop involving a range of expertise as well as representatives from district city and regional councils; ii) a design stage; iii) implementation, review and revision; iv) analysis of the findings; and v) incorporation of the feedback in the final decision.

3.1.1 Stage 1: Initial workshop

The BOPRC RPS engagement project began with an engagement strategy planning workshop in January 2014. This had cross agency and multi-disciplinary participation including planning and policy, CDEM, communication, community development and Māori policy expertise from the regional and territorial agencies of the BOP. There was also participation from both the authors of this report: Wendy Saunders as a GNS Science specialist in risk based planning; and Margaret Kilvington, a consultant involved with the GNS/Envirolink – risk-based planning project, who facilitated the workshop. The workshop spent some time ensuring that participants were comfortable with the complex definitions and uses of the term risk and the basis of a risk-based approach to land use planning. Participants were then able to discuss the needs of the territorial authorities regarding directives from the RPS and how "acceptable risk" could be adequately described to provide useful guidance for land use policy.

An outcome of the meeting was agreement on the need for public engagement on acceptable risk, but not necessarily on the best approach to follow. Participants at the workshop recognised that the options they could consider for delivering on the project's intentions were significantly constrained by the resources available through the PRPS project, and by the overall project timeline (public engagement was initially intended to be concluded by end of February 2014). Some local authorities wanted to hold localised hazard specific discussions with communities, but it was felt that this would be a six to 12 month process (which was beyond the Environment Court imposed timeframe). It was initially decided that an online survey would be the best option although there was concern that this was neither best practice, nor likely to deliver the kind of high level region wide response to natural hazard risk needed for the PRPS. However, the survey did not go ahead and the team involved in the process design came up with an alternative approach (see section 3.1.2.1).

Out of the workshop a working group (the risk threshold engagement team – Table 1) was tasked with the engagement process design and implementation. The risk threshold engagement team was set up to include community engagement and communications staff from BOPRC, Tauranga City Council (TCC), Western Bay of Plenty District Council (WBOPDC), and Whakatane District Council (WDC), as well as consultants.

This workshop was critical for clarifying terminology around risk, airing concerns and ensuring the project met the interests of the regional and territorial agencies. The group continued to convene as a committee to oversee the project, to consider stakeholder involvement, and to ensure representation from different community-wide interests.

Table 3   Summary of stages and key aspects of the "I can live with this" risk engagement process.

Stage 1 **Risk engagement strategy Workshop Jan 2014**	• Cross agency and multi-disciplinary participation including planning and policy, CDEM, communication, community development and Māori policy expertise from the regional and territorial agencies of the BOP. • Critical for clarifying terminology around risk, airing concerns and ensuring the project met the interests of the regional and territorial agencies. • Participants continued to convene as a committee to oversee the project. • A Working Group was tasked with process design and implementation.
Stage 2 **Process design**	• After consideration, the initial option of an online survey was rejected in favour of community sessions. More time was secured for the community engagement within the overall project. • The process was planned so as to hear from different voices of the Bay of Plenty Region (note distinct method from consultation, or public forums). • Engagement with tangata whenua was through a parallel process. • Community sessions had several stages designed to build capacity for participants to make meaningful judgements about risk acceptability. • Key components of the sessions (e.g., presentation material, survey questions and risk matrix table) were piloted internally.
Stage 3 **Implementation and review**	• Ran first community sessions, reviewed material and participation • Agreed format changes. • Set up three further community sessions to meet gaps in demographics of participants and to meet interest expressed by the public in attending sessions.
Stage 4 **Analysing the public feedback**	• Feedback from stakeholders was prepared for inclusion alongside views of planners and technical experts. • Analysis was not simply based on the numbers. It relies on interplay between the multiple sources of feedback during the community sessions. • Coding of responses into categories of acceptable or unacceptable used soft boundaries between thresholds to illustrate trends and counter low numbers distortion. • Responses across groups were compared and checked for consistent and inconsistent responses. • Final report summarised the information for use in Step 5.
Stage 5 **Determine risk thresholds for PRPS**	• United three streams of information from the community engagement process, a session run with the Lifelines group of the Bay of Plenty and technical advice received from GNS Science. • Used a four step process to compare different sources that made judgement calls transparent. • Showed how the community feedback contributed to the policy development around risk thresholds.

3.1.2 Step 2: Process design

The community engagement to support and feed into the PRPS Variation 2 decision-making process fundamentally relied on the concepts of good practice in public engagement advanced by the IAP2 (BOPRC, 2014b). IAP2 state that public participation means those affected by a decision are involved in the decision-making process; and that sustainable decisions are promoted by (i) providing participants with the information they need to be involved in a meaningful way, and (ii) clarifying how their input affects the decision.

It also utilised more specific principles of best practice developed as part of a guidance note on consultation on the RMA Quality Planning website[8] As noted in the BOPRC report on Work stream A (BOPRC 2014b) these include:

- Tailoring the consultation process to available resources and political expectations (taking into account available time, expertise and budget).

- Involving people who are committed, and who are effective at both listening and communicating.

- Proactively thinking about any potential cross-over with any consultation occurring around the same time – including under other legislation – and integrating other potentially related consultation where appropriate.

- Identifying and understanding your audience.

- Identifying and planning for consultation with tangata whenua, including an understanding of any additional or specific requirements under Treaty of Waitangi settlements.

- Being flexible and prepared to change the consultation approach as required, particularly as issues arise that need to be addressed more thoroughly.

- Having a strategy to manage media involvement in consultation.

The Working Group also recognised that natural hazard risk is a complex topic and had some unique challenges for public engagement – particularly the difficulty of conveying concepts of risk and enabling people to consider impacts that could occur far into the future. A key resource in designing the process was the Envirolink – risk-based approach to land use planning project and the associated toolbox developed by GNS Science (http://gns.cri.nz/Home/RBP/Risk-based-planning).

3.1.3 How useful is an online survey?

The risk threshold engagement team quickly recognised the complexity of the issue on which they were seeking public input. A process was required that would enable people to first build their understanding of natural hazard risk and how it might impact their locality. Only then could they consider how different local government policy and management options would affect their safety. This would enable them to make a considered response about what risk they could live with (i.e., was acceptable) and what levels of risk were not acceptable but required some mitigation (i.e., policy intervention from local government). For this reason, while initial budget and time constraints suggested an online survey might be most suitable, in-house testing of a survey revealed likely problems with conveying the information so that it was not misunderstood. There was also concern, particularly expressed by the territorial

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[8]   http://www.qualityplanning.org.nz/index.php/component/content/article/42-communication/118-guidance-note

agencies of the BOP, that the survey material would generate fears with no ability to respond to them. It was considered likely the survey would result in hasty and reactive responses and it was not pursued.

3.1.4 Community sessions

At the risk threshold engagement team meeting on 12 February 2014 a decision was made to run Community sessions similar to focus groups as opposed to producing an online survey. Focus groups are a recognised qualitative social research method (Morgan, 1997). They are essentially highly structured group interviews where the interactions between a groups member is as valid a source of information as the individual responses. In social science, focus groups have some constraints on participant numbers and commonality of factors such as gender, ethnicity, age or social experience (e.g., senior citizens using public transport). In the community sessions it was decided to take some of the core research strengths of focus groups (particularly the highly structured interview format), and combine this with public participation principles which would allow more flexibility to best engage with Bay of Plenty communities on risk thresholds within the confines of time, resourcing and budget.

The core principles for the design of the community sessions were:

- for sessions to be decision-oriented but values based;

- to both involve (i.e., to work directly with community to understand and consider their opinions and concerns) and collaborate (i.e., work together in developing a preferred model);

- to share information;

- to collect and compile input on a complex and emotive topic; and

- to reach a range of community members across the region (BOPRC, 2014b).

One of the key aims of the community sessions was to identify themes in regards to the community's perception of risk and risk tolerance. For example, were coastal communities more concerned about natural hazards than inland rural communities? In keeping with focus group methodology, exposure to different voices is more critical than absolute numbers of participants, as this reveals the extent to which ideas are shared or not shared by different sectors and communities. The risk threshold engagement team determined that it was important to ensure the engagement process heard from rural, urban, inland and coastal communities (Table 4).

Table 4 Community sessions for the "I can live with this" public engagement process.

Phase 1				
Type	**Location**	**Date**	**Attendees**	
Urban, rural, inland and coastal communities	Tauranga	10 March	45	Participants at these sessions were a mix of ages and gender. However, under representation of youth and young families led to additional sessions run in Phase 2.
	Paengaroa	11 March	11	
	Rotorua	12 March	15	
	Whakatāne	13 March	20	
	Ōpōtoki	14 March	6	
Iwi/hapū	Tauranga	10 March	13	
	Rotorua	13 March	5	
	Whakatāne	14 March	6	
Interested parties	Paengaroa	11 March	8	
Phase 2				**Details**
BOP Lifelines group	Paengaroa	20 March	18	Included representatives from New Zealand Transport Agency, telecommunication companies, power generation and transmission companies, Port of Tauranga, local authorities, District Health Boards, oil industry.
Early Childhood Education	Papāmoa	3 April	14	Included early childhood education and primary teachers and parents.
Youth Jam	Rotorua	8 April	10	Years 11–13 Secondary school students

In addition, there had been early agreement by the risk threshold engagement team that Māori engagement would follow a parallel but separate process enabling Māori of the Bay of Plenty region to have a distinct and independent voice on natural hazard risk. It was also recognised that there were particular stakeholders in natural hazard management in the Bay of Plenty that might be under represented in public forums. Consequently, in addition to the general sessions, one *invited parties* session was held in a central location at Paengaroa. The purpose of this session was twofold: 1) to deliberately invite stakeholders with specific knowledge and interest in decisions affecting the risks borne by communities through natural hazard management, and 2) discuss the cost implications of making decisions that affected the choices for future development of the region. These stakeholders were not asked to represent views of any constituency; rather they were recognised for having particular insight into the issues of various interest groups. They included those with a development interest, knowledge about how land use planning might affect vulnerable communities, experience in business recovery post natural hazard events, and experience with local government decision making at a community level.

The community sessions were open to anyone to participate and not restricted in numbers. They were widely advertised using a range of media and different opportunities. However, the sessions were carefully structured so in order to encourage full participation (rather than casual drop-in), information about the venue for each meeting was made available only to those who enquired about attending. After the initial round of meetings, the Working Group discussed participation, particularly noting the demographic spread at each of the meetings. It was decided that there had been insufficient participation by young people and by young families and that the specific expertise of those working in providing emergency lifelines

would also be beneficial to hear from. Additional sessions were run in a second phase. Table 4 lists the community sessions held in the two phases.

3.1.5 Content and format of the community sessions

The community session format needed to steadily build capacity to a point where participants are able to make informed judgement. Specifically the format needed to:

- Ensure participants had a clear idea of the type of information they were providing and how it would influence regional policy.

- Develop a shared understanding of natural hazard risk; its components of likelihood and consequence, as well as how natural hazards might impact the communities of the Bay of Plenty region.

- Enable participants to make the connection between natural hazard risk and actions that might be taken by local and regional government agencies (such as land use development policies).

- Generate meaningful responses from participants about risk acceptability and their expectations for local government action that could be incorporated alongside technical understandings of risk within the PRPS.

Held over two hours, the community sessions moved through four parts (Table 5). Each session was facilitated to promote discussion between those who attended. To begin, participants were given the context of the session – i.e., why the information was required, how it would be utilised and what further involvement in the decision-making process they could have (such as commenting on the draft PRPS). Participants were introduced to important concepts at the heart of natural hazard risk including the idea that risk was made up of both likelihood and consequence (for presentation material used in the sessions see Appendix 1). At this stage, participants were presented with working definitions of *acceptable, tolerable and intolerable risk* (Table 6).

Regional council planning staff involved in the project intuitively recognised the importance of linking 'acceptable risk' to meaningful context and consequence (Gregory & Satterfield, 2002). Consequently, the terms acceptable, tolerable and intolerable risk needed to be directly understood in everyday terms and linked to their meaning in terms of local government policy outcomes. For instance in the material presented at the sessions, the BOPRC talked about *acceptable risk* as risk that people were prepared to live with knowing that no measures would be taken by local government to reduce it. The BOPRC RPS policy aim would be to have all future developments fit into the acceptable risk category. The everyday description was "This is part of daily life – these things happen". Table 6 outlines the risk threshold meanings and links to policy used by the BOPRC (BOPRC, 2014b).

From the experience of running the first session it quickly became apparent that the initial presentation and discussion step was critical to the session. It was particularly important to enable participants to consider their own experiences of how natural hazard events can affect their local community before they were introduced to abstract ideas about risk. This influenced the order of presentation for future sessions with later sessions encouraging discussion about personal experiences and awareness of natural hazards first.

Table 5   BOPRC RPS – engagement project – community session format

Sessions held with rural, urban and coastal communities; tangata whenua; and interested parties	
Session parts	**Key resources**
Part 1 Presentations and discussion on i. local experience with natural hazard events; ii. ways to understand risk; and iii. the purpose of the RPS in managing natural hazard risk.	• Power point presentation (Appendix 1). • Images of local hazard events • Meanings for acceptable, tolerable and intolerable risk (Table 6). • Tangible links to policy implications.
Part 2 Participants answer questions designed to prompt thinking about their expectations about the role of local government in managing natural hazards.	• Set of six questions (also available online for those unable to attend meetings) (Appendix 2).
Part 3 Participants take part in a scenario based risk matrix exercise.	• Matrix outlining possible locally relevant natural hazard event scenarios and time periods estimated in terms of life time occurrence.
Part 4 Opportunity to ask questions, revisit their earlier responses and get further information about next steps.	• Civil defence and/or local government staff able to respond to local issues.

In the second part of the session, participants answered a set of six questions around local government responsibilities (Appendix 2). They completed these individually and then discussed their responses as a group. These questions were not intended to be a survey of public opinion about local government role in natural hazards management. Rather, they were designed to prompt people's thinking and ground people in the task of weighing up the margins of safety in which they would be willing to invest in exchange for avoiding potentially negative consequences. Discussion about the questions was as important as individual responses.

In the third part of the session participants were asked to personally rate the risk of minor to catastrophic events, happening at a range of likelihoods as *acceptable, tolerable or intolerable* (using the definitions of these categories from Table 6). This part of the session utilised participants already developed thinking about natural hazard impacts and the role of local government in addressing these. This stage was the heart of the engagement session and provided feedback that could be directly incorporated into a rating of acceptable risk in the regional policy statement.

Table 6   BOPRC RPS Project – definitions of risk and links to policy.

Acceptable risk:	Definition: Risk that people are prepared to live with knowing that no measures will be taken to reduce it.
	Everyday description: *Part of daily life – these things happen*
	Policy: All future activities should fit within this threshold
Tolerable Risk:	Definition: Risk that people are prepared to endure because of the benefits of the activity but expect measures to be taken to reduce it.
	Everyday description: *when it's awful but you know that your family and community can recover from it in time*
	Policy: measures should be taken to reduce the risk for existing activities that fit within this threshold.
Intolerable Risk:	Definition: Risk that people are not prepared to endure regardless of the benefits of the activity.
	Everyday description: *NO WAY – risk is so great that it can't be justified.*
	Policy: Activities will not be permitted within this threshold except in limited unpreventable circumstances (e.g., ports by their nature may be unavoidably located in high risk areas)

In designing the third part of the community session, the risk threshold engagement team wanted to avoid participants responding to risk acceptability based on the likelihood alone (a common pitfall in talking to people about risk). This amounts to people responding simply to *the chance that it would happen to them* – which can be influenced by their personal sense of optimism or empowerment, fear, or recent experience. This part of the session utilised a scenario based exercise that encouraged participants to consider the impacts of events across the community as a whole, and include this in their assessment of overall risk acceptability. The tool used to capture participant's responses to the scenarios was a matrix (Figure 2).

Termed 'I can live with this risk', the matrix was based on resources provided in Envirolink RBPA toolkit (Saunders et al., 2013). These resources included the consequence table which establishes criteria to assess minor, moderate, major and catastrophic events across a range of well-beings (social/cultural, buildings, critical buildings, lifelines, economic, health and safety) (Saunders et al., 2013, p. 29) (Figure 3). It also used a scale of likelihood reframed for simplicity into lifetime experiences (e.g., there is a 90% chance I will experience this in my lifetime) (Figure 4).

I can live with this risk….

Your councils could spend millions of dollars and set new rules to protect the community from all sorts of natural disasters, but some of those disasters might not happen for another 1,000 years. Or, they might happen tomorrow. That's the risk. How much do you think we need to plan for?

Nothing we do is free from risk, so how often do you think the community would put up with each of these disasters? (before marching into the council to politely but firmly suggest that they should never happen again?) We have based these assumptions of lifetime on an 80 year lifespan.

		Likelihood				
*Think of an event that could happen in your **community** then apply this image when working through this table – read the scenario then scroll across the page and mark your thoughts in each space using the symbols as per below:* • Acceptable – this is part of life that I could put up with ✔ Tolerable – my family and community could recover in time if we had to ✘ Intolerable – NO WAY – this risk is too great. It can't be justified		**Once every 50 years (Likely)** *90% chance for me*	**Once every 100 years (Possible)** *80–90% chance for me*	**Once every 100–1000 years (Unlikely)** *15–80% chance in my and my grandchild's lifetime*	**Once every 1000–2500 years (Rare)** *5–15% chance in my and my grandchild's lifetime*	**More than 2,500 years (Very Rare)** *Less than 5% chance in my and my grandchild's lifetime*
Consequences	(V) The natural event is catastrophic. Nearly half of the liveable homes are wiped out. Some can be rebuilt but many can never return. One quarter of hospitals/marae etc. have been badly damaged and are unable to be safely used. Many are beyond repair. It kills over 100 people. Businesses and livelihoods are lost. [up to 10% GDP or annual income]					
	(IV) Up to a quarter of schools, hospitals and marae have been damaged (and are struggling to function). Half of the homes in your community have been damaged, some of those can be rebuilt but many can't. It may take up to six months to fix the water and roads. Over 10 people died with more than 100 injured. About 20% of the town centre will be closed off for anything from a week to a month. [10% of GDP or annual income]					
	(III) In your community of 1,000 homes about 60–100 houses are unliveable, the natural event knocks out power and water networks. For a week daily life revolves around getting bottled water and queuing up at the portaloos. Some businesses can't open. The natural event injures up to 100 people. [1% of GDP or annual income]					
	(II) This event has affected 20–100 houses in your community of 1,000, with the local marae and school out of action for up to a day and the town centre is closed briefly. The hospital is able to function but has some damage. You may need to use a bucket for the toilet for the day. No-one died but 10 people were injured.					
	(I) You have had a big fright from this event but basically there has been no real damage and the local shops were only closed for a couple of hours. No-one was injured.					

Figure 1   Scenario matrix and text used by BOPRC in the community sessions to assess risk tolerance.

Severity of Impact	Built				Economic	Health &Safety
	Social/Cultural	Buildings	Critical Buildings	Lifelines		
Catastrophic (V)	≥25% of buildings of social/cultural significance within hazard zone have functionality compromised	≥50% of affected buildings within hazard zone have functionality compromised	≥25% of critical facilities within hazard zone have functionality compromised	Out of service for > 1 month (affecting ≥20% of the town/city population) OR suburbs out of service for > 6 months (affecting < 20% of the town/city population)	> 10% of regional GDP	> 101 dead and/or > 1001 inj.
Major (IV)	11-24% of buildings of social/cultural significance within hazard zone have functionality compromised	21-49% of buildings within hazard zone have functionality compromised	11-24% of buildings within hazard zone have functionality compromised	Out of service for 1 week – 1 month (affecting ≥20% of the town/city population) OR suburbs out of service for 6 weeks to 6 months (affecting < 20% of the town/city population people)	1-9.99% of regional GDP	11 – 100 dead and/or 101 – 1000 injured
Moderate (III)	6-10% of buildings of social/cultural significance within hazard zone have functionality compromised	11-20% of buildings within hazard zone have functionality compromised	6-10% of buildings within hazard zone have functionality compromised	Out of service for 1 day to 1 week (affecting ≥20% of the town/city population people) OR suburbs out of service for 1 week to 6 weeks (affecting < 20% of the town/city population)	0.1-0.99% of regional GDP	2 – 10 dead and/or 11 – 100 injured
Minor (II)	1-5% of buildings of social/cultural significance within hazard zone have functionality compromised	2-10% of buildings within hazard zone have functionality compromised	1-5% of buildings within hazard zone have functionality compromised	Out of service for 2 hours to 1 day (affecting ≥20% of the town/city population) OR suburbs out of service for 1 day to 1 week (affecting < 20% of the town/city population)	0.01-0.09 % of regional GDP	<= 1 dead and/or 1 – 10 injured
Insignificant (I)	No buildings of social/cultural significance within hazard zone have functionality compromised	< 1% of affected buildings within hazard zone have functionality compromised	No damage within hazard zone, fully functional	Out of service for up to 2 hours (affecting ≥20% of the town/city population) OR suburbs out of service for up to 1 day (affecting < 20% of the town/city population)	<0.01% of regional GDP	No dead No injured

Figure 2 Consequence matrix from the risk based planning approach (Saunders et al., 2013). This matrix was a key resource in compiling the scenario matrix for the community sessions on risk thresholds.

Level	Descriptor	Description	Indicative frequency
5	Likely	The event may occur several times in your lifetime	Up to once every 50 years
4	Possible	The event might occur once in your lifetime	Once every 51–100 years
3	Unlikely	The event does occur somewhere from time to time	Once every 101–1000 years
2	Rare	Possible but not expected to occur except in exceptional circumstances	Once every 1001–2,500 years
1	Very rare	Conceivable but highly unlikely to occur	2,501 years plus

Figure 3   Likelihood levels from the risk based planning approach (Saunders et al., 2013). This was a key resource in compiling the scenario matrix for the community sessions on risk thresholds.

The scenario based exercise converted the possible impacts from natural hazard events into locally meaningful stories. For example an event categorised as minor in the RBPA matrix is translated into this scenario in the BOPRC scenario matrix:

This event has affected 20–100 houses in your community of 1,000, with the local marae and school out of action for up to a day and the town centre is closed briefly. The hospital is able to function but has some damage. You may need to use a bucket for the toilet for the day. No one died but 10 people were injured.

In the exercise during the community sessions, participants were asked to imagine any kind of natural hazard event (e.g., flooding, tsunami, earthquake) that has impacted their community. They then considered the different levels of impact the event might have and the chance that it would happen to them or their children, and asked to rate the different combinations of consequence and likelihood as acceptable, tolerable or intolerable. Their responses were recorded on matrix sheets.

In the final stage of the session, participants were given a chance to reflect on their responses to the earlier questions about the role of local government and change these if they wished. This stage was also a good opportunity for participants to ask particular questions about their locality or their concerns. It was important, particularly for this stage, to ensure that a local expert was available to hear and respond to specific issues. Civil defence and/or local territorial authority staff were present at each community session to answer any questions.

3.1.6   Step 3: Implementation and review

In this part of the risk engagement process, the risk threshold engagement team held a midway review with consultant Margaret Kilvington on how well the sessions had run. Overall they were very pleased with the level of engagement, particularly given the regional level policy basis to the discussion which is commonly regarded as difficult to elicit public interest in. People were willing and able to discuss the issues and it was obvious that they understood why they were there and what the task was.

There were several key points from this review that led to changes in the process:

- All segments of the session held the basic ingredients needed for enabling participants to have a meaningful input into the decision on delineating acceptable risk. However, the introduction section needed re-ordering. People at the first hui in Tauranga had been keen to discuss recent experiences (particularly the sinking of the Rena and associated oil spill[9]). The original structure of the presentation meant there was too much general information at the beginning. The conversation needed to begin differently so in subsequent meetings people were asked to talk upfront about natural hazards and their experience of these.

- In the first meetings participants began to complete the matrix before the task had been outlined. In future sessions the matrix was not handed out until after participants had been briefed on the task.

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[9]   On the 5th of October 2011 the MV Rena grounded on Te Tau Otaiti (Astrolabe Reef) in the Bay of Plenty resulting in one of New Zealand's most significant maritime environmental disasters (Ministry for Environment 2011).

- The demographic spread of participants favoured those over 40. The facilitators of the community sessions (a subset of the risk engagement team) noted good contribution from a small number of younger participants at the Rotorua meeting and decided to run a session at the upcoming Youth Jam event. They also decided to run a further community session organised through a local pre-school in the Pāpāmoa area; and to offer the BOP Lifelines group the chance to complete the matrix at their next meeting.

3.1.7   Step 4: Analysing the public feedback

In participatory risk management, understanding is produced through a fusion of sources of information. Step 4 is the process by which the voices of stakeholders, their ideas, concerns and opinions are rendered ready for direct dialogue with those of planners and technical experts.

The consequence and likelihood matrix completed by participants in the third part of the community session directly parallels the risk based planning framework used in the BOPRC PRPS. However, tempting as it might be to simply add up the responses and express these as a single community voice, the "I can live with this" engagement on risk process cannot be analysed as a statistical sample of the regional viewpoint. The process involved relatively small groups of interested participants who developed capacity for an informed and considered judgment throughout the session. The information from the community sessions was fundamentally qualitative. Analysis of how much people were willing to trade natural hazard risk for council policy intervention depended on interplay between the multiple sources of feedback during the community sessions. This included:

- Reviewing the question responses in each group – was there a largely shared view of the role of local government? Were there significant divergent views?

- Reviewing the meetings – were participants distracted by anything, such as a recent local event? Were they clear about what they were doing?

- Analysing the individual responses to the matrix and the group responses as a whole – was the matrix response logical (or for instance did one participant just tick a whole row)? Was there an overall trend in the responses from the group or were there strongly divergent views?

To aid analysis of the overall response from each group to the question of risk acceptability it was useful to create a visual picture. The analysis used a colour coded key with 'soft boundaries' i.e., although there were three formal categories of acceptable, tolerable, intolerable risk, a key was developed with additional categories and colours to indicate responses such as Acceptable/Tolerable (acceptable but tending towards tolerable) or Tolerable/Intolerable (tolerable but tending towards intolerable) (Figure 4). In addition, the percentage responses were recorded for each category and any significant minority contrary voice was also noted. Figure 5 is an example of coding for one of the community sessions. It is important to note that the key was devised to help review the responses from groups of varying size some of which were quite small. In small groups a single divergent voice can have high impact (e.g., one person shifting the overall group response from tolerable to acceptable). It was important to be able to acknowledge divergence but also to recognise overall trend. The key was used to analyse the responses from all the community sessions, the overall summary of the community sessions and the session held with the Bay of Plenty Lifelines group. It was not used for analysing the response from GNS Science as this was a single source response.

The analysis of the community sessions looked for:

- Important emergent themes such as the favouring or rejecting of local government roles and activity in hazard management.

- Commonality within groups and between groups as well as any notable divergence.

- Possible explanations of responses to natural hazard risk revealed in the different groups. For instance at the hui, the session facilitators noted that some iwi participants were less inclined to discount future risk than in the predominantly pakeha meetings – regarding risk to children or grandchildren as equally or even more significant than risk encountered in their own lifetime.

- From this analysis an internal report was produced for the project team, and an overall summary report was produced and made available to the general public (Figure 6). While the summary included all sessions – i.e., both iwi hui and general community sessions, responses from the parallel iwi sessions were also analysed separately and provided back to participants so as to honour the agreement to provide independent expression to the voice of tangata whenua in the process.

A	90% or more described this as acceptable or tolerable and the % who found it only tolerable was 10% or less.
A-	70% or more found this acceptable. Those who found it tolerable was no more than 25%.
A/T	70% or more found this acceptable or tolerable with the majority finding it acceptable. 50/50 is where % or respondents were even for both acceptable and tolerable.
T/A	70% or more found this acceptable or tolerable with the majority finding it tolerable.
T	Majority find this Tolerable – those who find acceptable or intolerable differs by 4% or less.
T/I	70% or more found this tolerable or intolerable with the majority finding it tolerable.
I/T	70% or more found this tolerable or intolerable with the majority finding it intolerable.
I-	More than 70% found this intolerable and less than 10% found it acceptable.
I	89% or more found this Intolerable or tolerable the % of who found it tolerable was 10% or less.
?	This indicates the presence of a significant minority contrary voice of 20% or more.

Figure 4   Key devised to review the matrix responses[10].

	Insignificant I	Minor II	Moderate III	Major IV	Catastrophic V
Very rare 1	100% A	64% 36% A/T-	29% 36% 36% T/I ?A	14% 29% 57% I/T	0% 14% 86% I
Rare 2	100% A	64% 36% A/T-	21% 43% 36 T/I ?A	0 36 64 I/T	O% 7% 93% I
Unlikely 3	100% A	50% 50% A-	7% 43% 53 I/T	0% 21% 79% I	100% I
Possible 4	100% A	50% 50% A/T	7% 43% 50% I/T	0% 7% 93% I	100% I
Likely 5	100% A	50% A/T 50% A/T	7% 38% 57% I/T	7% 93 %I	0 100% I

Figure 5   Example of coded matrix responses for one of the community sessions[11].

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[10] Note this key was developed specifically for this project by the consultant Margaret Kilvington. It was not based on criteria established elsewhere. Boundaries were set to avoid undue significance attributed to minor divergence in small groups. If you want to establish more rigour in the key an accepted method is to convene a group of experts to agree where the boundaries would lie.

[11] To read this coded matrix note that the column "Insignificant I" corresponds to the level of consequences I in the scenario matrix (Figure 1). The column Minor (ii) similarly corresponds to the level of consequences II in the scenario matrix etc. The percentages reflect the number of respondents in the group who responded acceptable, tolerable or Intolerable. The colour code indicates the overall interpretation of the response. For example, events with minor consequences that were rare were regarded as acceptable by 64% and tolerable by 36%. Review of the overall trend and responses in this session suggested an appropriate category for this was acceptable/tolerable.
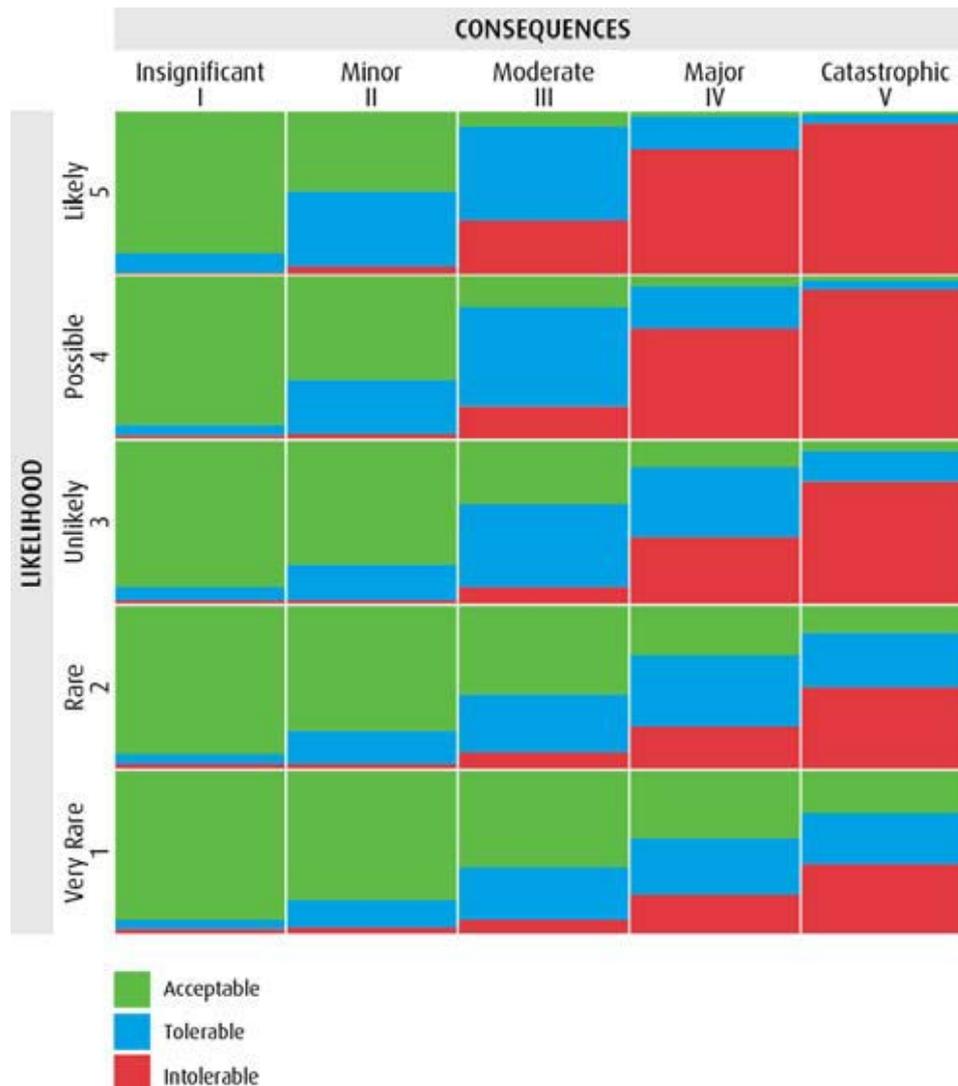
Figure 6 Trend summary of responses from all sessions provided as part of initial feedback from Work stream A[12].

The local government agency members of the project overview group were particularly interested to know what, if any, divergence there was in the voices from around the Bay of Plenty region. For example were some parts of the Bay of Plenty region less accepting of natural hazard risk than others? The analysis of the feedback from the community sessions found groups showed only minor trend differences towards acceptability or intolerability when compared with the overall summary responses. Only two out of 10 groups showed stronger divergence than others. The early childhood education group (Table 4) was more risk averse than the other groups. This community session was held in Pāpāmoa, an area known for risk from Tsunami and other natural hazards. Awareness of natural hazards is high in this community. Analysis of the response to risk expressed through the matrix completed by the Lifelines group (Table 4) also showed a divergence from the overall response. This group was more influenced by likelihood than impact. The Lifelines group is made up of professionals who are experienced in the field of risk management but who largely deal with likelihoods. Importantly they did not undertake all the parts of the community session, but were asked to complete the matrix during an already scheduled meeting. They were

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[12] It is important to note that this summary of responses is specific to the communities of the Bay of Plenty. It is a summary of focus group feedback and is therefore indicative not statistical. Similar processes run elsewhere may reveal different views on natural hazard risk acceptability.

therefore not exposed to the introductory material that helped participants recognise the importance of considering both consequence and likelihood.

A trend summary of the sessions without detail (Figure 6) was provided in the final report from Work Stream A to the overview group (BOPRC 2014b). A more detailed summary and accompanying interpretation notes were provided to enable further interpretation in Stage 5.

3.1.8 Step 5: Determining risk thresholds for the PRPS

Determining where to place the thresholds between both acceptable and tolerable risk, and tolerable and intolerable risk, is fundamental to a risk based approach to regional land use planning and policy development. One of the core intentions behind the revisions to the natural hazards management provisions of the BOP RPS was to extend the thresholds for risk acceptability beyond the existing provisions which focussed on life loss. The final recommendations to the PRPS natural hazards variation proposed two sets of thresholds used together: one relating to loss of life, and the other relating to a range of other consequences (BOPRC, 2014d).

Risk threshold for the BOPRC RPS – loss of life

For loss of life the most obvious metric is the annual individual fatality risk (AIFR[13]). This is a common metric and had been previously used in the proposed Bay of Plenty RPS. Bay of Plenty communities were not invited to comment specifically on the thresholds for loss of life. Rather, staff recommendations were that thresholds for this be derived from up to date practice internationally and in New Zealand (particularly, recent work establishing risk thresholds for rock fall in the Christchurch Port Hills following the 2010–2012[14] earthquakes). The recommended loss of life thresholds correspond to those in the proposed RPS notified in November 2010, which were not challenged in submissions (Figure 7).

Acceptable	AIFR < 1×10^{-6}
Tolerable	AIFR > 1×10^{-6} and < 1×10^{-4}
Intolerable	AIFR > 1×10^{-4}

Figure 7 Loss of life thresholds recommended for the BOP PRPS (BOPRC, 2014c).

Risk thresholds for the BOPRC RPS – other consequences

The second set of thresholds represented a significant shift in risk assessment in the RPS. This utilised the framework developed through the RBPA (Saunders et al., 2013). Public input, though the "I can live with this" engagement project, was a core component of establishing the thresholds.

In the RBPA, risk is regarded as a product of consequence and likelihood (R = C x L). Consequences are categorised from 1–5 (minor to catastrophic), and assessed using qualitative and quantitative descriptors of a range of community impacts, such as damage to infrastructure, buildings, lifelines as well as effect on public health and wellbeing (Figure 2)

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[13] Annual individual fatality risk (AIFR) is obtained by dividing the number of deaths (N) (derived from modelling) by the population exposed (P) and the computed return period for the scenario in years (R): AIFR = N / (P x R) (BOPRC 2014c).

[14] There are many GNS Science reports and maps available on the Port Hills risk thresholds – see http://www.ccc.govt.nz/environment/land/slope-stability/port-hills-gns-reports/ for a list of reports and maps that can be downloaded.

Likelihood is similarly classified from 1–5 (very rare to likely) (Figure 3). Using a similar approach to the RBPA, in the BOPRC PRPS levels of likelihood were classified as 1–5 based on indicative frequencies defined using annual exceedance probability (AEP %), annual return intervals, and plain language descriptors (Figure 8).

Likelihood level	Indicative frequency			
	AEP(%)*	ARI** (years)	Description	Descriptor
5	≥ 2	≤ 50	Event might occur several times in a lifetime	Likely
4	<2–1	51–100	Event might occur once in a lifetime	Possible
3	<1–0.1	101–1000	Event does occur somewhere from time to time	Unlikely
2	<0.1–0.04	1001–2500	Possible but not expected to occur except in exceptional circumstances	Rare
1	<0.04	>2500	Conceivable but highly unlikely to occur	Very rare
*AEP = annual exceedance probability				
**ARI = annual return interval				

Figure 8   Likelihood classification used to assess risk thresholds for a wide range of consequences (BOPRC 2013c).

As in the RBPA, likelihood levels and consequence levels are brought together in a matrix to generate risk levels. Each cell is coloured using a standard 'traffic light' colour code to indicate the risk level (Figure 9):

Level of risk	Colour
Acceptable	
Tolerable	
Intolerable	

Figure 9   Colour coded risk levels in the RBPA (Saunders et al., 2013).

In the BOP PRPS natural hazards variation, setting the risk thresholds meant drawing on three sources of assessment:

a.   Findings from the "I can live with this" community engagement,

b.   Results from a survey of attendees of a Lifelines group meeting, and

c.   Recommendations of technical specialists from GNS Science (single source of expertise).

The coded matrices for each information source are below (Figure 10–Figure 12).

Likelihood	Consequences				
	1	**2**	**3**	**4**	**5**
5	green	orange	orange	red	red
4	green	green	orange	orange	red
3	green	green	green	orange	orange
2	green	green	green	green	orange
1	green	green	green	green	green

Figure 10 Source 1: GNS Science response; as a single expert source, all scores are 100% (green = acceptable, orange = tolerable, red = intolerable).

	Insignificant I	**Minor II**	**Moderate III**	**Major IV**	**Catastrophic V**
Likely 5	A 87%A 12%T	A/T 64%A 46%T 5% I	T/I 9%A 58%T 33%	I- 3%A 20%T 77%	A 2%A 5%T 93%I
Possible 4	A 100%A	A/T 64%A 33%T 3%I	T 19%A 61%T 20% I	I/T 6%A 26% T 68% I	I 3%A 5%T 92%I
Unlikely 3	A 100%A	A- 76%A 22%T 2%I	T/A 39%A 51%T 10%I	T/I 0%A 53%T 47%I	I–6%A 19%T 75% I
Rare 2	A 100%A	A- 77%A 20%T 3%I	A/T 53%A 47%T 0%I	T/A?I 30%A 44%T 26%I	I/T 16%A 34%T 50%I
Very rare 1	A 100%A	A- 79%A 17%T 4% I	A/T 59%A 36%T 9%I	A/T?I 41%A 35%T 24%I	I/T?A 26%A 31%T 43%I

Figure 11 Source 2: Community engagement response summarised and detailed (A = acceptable, T = tolerable, I = intolerable). Colour variations represent weighting of response, based on three categories of acceptable (green), tolerable (orange), and intolerable (red).

	Insignificant I	Minor II	Moderate III	Major IV	Catastrophic V
Likely 5	A/T 58%A 37%T 5%I	T/A 42%A 47%T 11%I	T/I 5%A 68%T 26%I	I- 0%A 11%T 89%I	I 100%A
Possible 4	A/T 58%A 42%T 0%I	T/A 37%A 58%T 5%I	T 21%A 58%T 21%I	T/I 0%A 53%T 47%I	I-- 0%A 11%T 89%I
Unlikely 3	A- 84%A 16%T 0% I	A- 84%A 16%T 0% I	A/T 53%A 47%T 0%I	T/A 16%A 74%T 11%	T/I 16%A **XXXX** 58%T 26%I
Rare 2	A 100%	A 100%	A- 89%A 11%T	A- 74% A 21%T 5%I	A/T 53%A 42%T 5%I
Very rare 1	A 100%	A 100%	A 95%A 5%T	A- 84%A 16%T	A- 79%A 16%T 5%I

Figure 12   Source 3: Lifelines group response summarised and detailed (A = acceptable, T = tolerable, I = intolerable). Colour variations represent weighting of response, based on three categories of acceptable (green), tolerable (orange), and intolerable (red).

Reconciling different sources for the BOPRC RPS risk thresholds – other consequences

The three streams of advice were brought together to compile one recommended set of thresholds for other consequences. These used a four step process:

i.   Insert all 100% scores.

ii.   Insert all remaining scores and colours.

iii.   Make judgement calls where majorities from each information stream align; leave blank where there are inconsistent majorities requiring considered judgement.

iv.   Make considered judgement for outlier areas – relying on knowledge about how numbers were determined and weight of opinion, as well as consistency and workability of final outcome.

At times, where there was divergence of opinion between the three groups, this required a judgement on which direction to take. Factors that were weighed up were the strength of opinion expressed by each contributing stream, the overall trend towards risk acceptability and emphasis on either consequence or likelihood.

The following set of tables (Table 7–Table 11) illustrates the process used to derive the risk thresholds.

Four step process to reconcile 3 sources on risk thresholds

Table 7 Step 1: Insert all 100% scores.

Likelihood	Consequences														
	Insignificant 1			**Minor 2**			**Moderate 3**			**Major 4**			**Catastrophic 5**		
	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS
Likely 5			Green			Orange			Orange			Red		Red	Red
Possible 4	Green		Green			Green			Orange			Orange			Red
Unlikely 3	Green		Green			Green			Green			Orange			Orange
Rare 2	Green	Green	Green		Green	Green			Green			Green			Orange
Very Rare 1	Green	Green	Green		Green	Green			Green			Green			Green

Table 8 Step 2: Insert all remaining scores and colours (A = acceptable, T = tolerable, I = intolerable). Colour variations represent weighting of response, based on three categories of acceptable (green), tolerable (orange), and intolerable (red).

Likelihood	Insignificant 1			Minor 2			Moderate 3			Major 4			Catastrophic 5		
	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS
Likely 5	87% A 12%T	58%A 37%T		64%A 46%T	42%A 47%T		58%T 33% I	68%T 26%I		20%T 77% I	11%T 89%I		5 %T 93 %I	100%A	
Possible 4		58%A 42%T		64%A 33%T	37%A 58%T		19%A 61%T 20% I	21%A 58%T 21%I		26% T 68% I	53%T 47%I		5%T 92%I	11%T 89%I	
Unlikely 3		84%A 16%T		76%A 22%T	84%A 16%T		39%A 51%T	53%A 47%T		53%T 47%I	16%A 74%T		19%T 75% I	16%A 58%T 26%I	
Rare 2				77%A 20%T			53%A 47%T	89%A 11%T		30%A 44%T 26%I ?I	74% A 21%T		34%T 50%I	53% A 42%T	
Very Rare 1				79%A 17%T			59%A 36%T	95%A 5%T		41%A 35%T 24%I ?I	84%A 16%T		26%A 31%T 43 %I ?A	79%A 16%T	

Table 9 Step 3: Make judgement calls where majorities from each information stream align; white cells reflect inconsistent majorities requiring considered judgement (eight areas). A = acceptable, T = tolerable, I = intolerable. Colour variations represent weighting of response, based on three categories of acceptable (green), tolerable (orange), and intolerable (red).

Likelihood	Insignificant 1			Minor 2			Moderate 3			Major 4			Catastrophic 5		
	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS
Likely 5	87% A 12%T				42%A 47%T		58%T 33% I	68%T 26%I		20%T 77% I	11%T 89%I		5 %T 93 %I	100%A	
Combined															
Possible 4		58%A 42%T		64%A 33%T	37%A 58%T		19%A 61%T 20% I	21%A 58%T 21%I		26% T 68% I	53%T 47%I		5%T 92%I	11%T 89%I	
Combined															
Unlikely 3		84%A 16%T		76%A 22%T	84%A 16%T		39%A 51%T	53%A 47%T		53%T 47%I	16%A 74%T		19%T 75% I	16%A 58%T 26%I	
Combined															
Rare 2				77%A 20%T			53%A 47%T	89%A 11%T		30%A 44%T 26%I ?I	74% A 21%T		34%T 50%I	53% A 42%T	
Combined															
Very Rare 1				79%A 17%T			59%A 36%T	95%A 5%T		41%A 35%T 24%I ?I	84%A 16%T		26%A 31%T 43 %I ?A	79%A 16%T	
Combined															

Table 10 Step 4*:* Make considered judgement for outlier areas – relying on knowledge about how numbers were determined and weight of opinion, as well as consistency and workability of final outcome. Specific judgements are noted in the BOPRC final recommendations (BOPRC, 2013d – Appendix 3). A = acceptable, T = tolerable, I = intolerable. Colour variations represent weighting of response, based on three categories of acceptable (green), tolerable (orange), and intolerable (red).

Likelihood	Consequences														
	Insignificant 1			Minor 2			Moderate 3			Major 4			Catastrophic 5		
	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS	Community	Lifelines	GNS
Likely 5	87% A 12%T				42%A 47%T		58%T 33% I	68%T 26%I		20%T 77% I	11%T 89%I		5 %T 93 %I	100%A	
Combined															
Possible 4		58%A 42%T		64%A 33%T	37%A 58%T		19%A 61%T 20% I	21%A 58%T 21%I		26% T 68% I	53%T 47%I		5%T 92%I	11%T 89%I	
Combined															
Unlikely 3		84%A 16%T		76%A 22%T	84%A 16%T		39%A 51%T	53%A 47%T		53%T 47%I	16%A 74%T		19%T 75% I	16%A 58%T 26%I	
Combined															
Rare 2				77%A 20%T			53%A 47%T	89%A 11%T		30%A 44%T 26%I ?I	74% A 21%T		34%T 50%I	53% A 42%T	
Combined															
Very Rare 1				79%A 17%T			59%A 36%T	95%A 5%T		41%A 35%T 24%I ?I	84%A 16%T		26%A 31%T 43 %I ?A	79%A 16%T	
Combined															

Table 11 The final result – BOPRC risk thresholds included in the PRPS. Colour represents three categories of acceptable (green), tolerable (orange), and intolerable (red).

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likely 5	🟩	🟧	🟧	🟥	🟥
Possible 4	🟩	🟩	🟧	🟧	🟥
Unlikely 3	🟩	🟩	🟧	🟧	🟥
Rare 2	🟩	🟩	🟩	🟩	🟧
Very Rare 1	🟩	🟩	🟩	🟩	🟧

A comparison between Table 11 and Table 7–Table 10 shows that the final result is a unique response to risk thresholds for the Bay of Plenty region.

**Summary of key aspects of the BOPRC public engagement on risk**

- The BOPRC RPS community engagement was fundamentally a process of public participation in policy development. The ultimate aims of the project were to gain peoples' input into: *what level of risk they want their community to be safeguarded from; and when the risk of a natural hazard event can be regarded as acceptable, tolerable or intolerable*.

- The project had five stages: (i) an initial workshop involving a range of expertise as well as representatives from district city and regional councils; (ii) a design stage; (iii) implementation, review and revision; (iv) analysis of the findings; and (v) incorporation of the feedback in the final decision.

- An initial idea of doing an online survey was considered and rejected in favour of community sessions which combined the structured inquiry process of focus groups within a more open public participation process, enabling the BOPRC to hear views from communities across the region.

- The process used in the community sessions was specifically designed to meet some of the unique challenges of communication on risk; particularly the need for enagement processes that build capacity for judgements on risk acceptability that are linked to local government policy or action.

- A key resource for designing the community sessions was the risk-based planning approach toolkit developed by GNS Science.

- The project was adaptive and the community sessions were reviewed, amended and added to so as to better capture public input.

- Careful analysis of the feedback from the sessions enabled interpretation beyond simply counting up responses.

- A four step process was used to integrate public views alongside expert and technical opinion in a transparent way.

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4.0 ROBUSTNESS AND VALIDITY OF THE BOPRC APPROACH

Local government are naturally concerned to ensure they achieve robust decisions. In the planning context this particularly means ensuring decisions are made that leave no doubt over the premise or the conclusions which might open up contention or even result in litigation. Given the significance of the thresholds for acceptability to the entire risk based approach to natural hazards within the PRPS, and the novelty of including public input at this stage in the hazards policy development process, robustness was a constant concern to the risk threshold engagement team and the entire PRPS Variation 2 project.

Robustness in a process of public engagement on policy can be viewed as having three foundational elements: valid process, valid interpretation, valid and transparent integration (Figure 13).
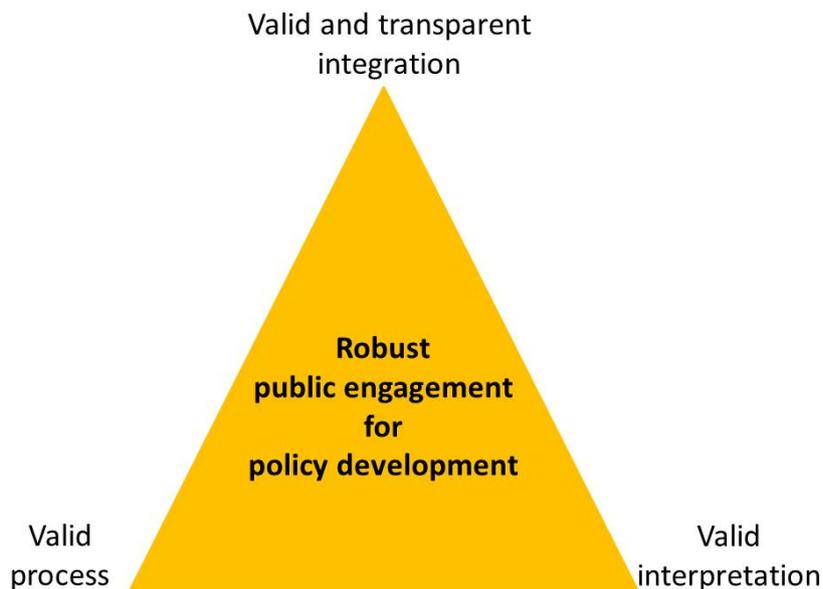
Figure 13 Foundational elements of robust public engagement for policy development.

4.1 A VALID PROCESS FOR ENGAGEMENT ON ACCEPTABLE RISK

The public engagement process for the BOPRC PRPS was responsive to the overall demands of good public participation practice as outlined by such recognised authorities such as the IAP2[15] and the guidance note on public participation provided by the Quality Planning resource management website[16] .Moreover, the four step process used in the community sessions was designed to achieve some more specific and quite complex demands associated with engagement on risk tolerance:

- to develop participants' understanding of risk as more than chance or likelihood;
- to link ideas about risk tolerance to potential policy implications for local government;

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[15] http://www.iap2.org/),

[16] qualityplanning.org.nz/index.php/component/content/article/42-communication/118-guidance-note

- to build capacity for judgment – i.e. to be able to weigh up the margins of safety in which participants would be willing to invest in exchange for avoiding potentially negative consequences.

The adoption of some of the formalised structure of the focus group methodology enabled clear information to be gathered for later use in the decision making process. Modifications made to the focus group method, such as a low (but not non-existent) barrier to participation of having to actively seek out the venue and meeting time, enabled those willing and purposeful to attend the meetings, while still providing good open access to the process. Locating community meetings around different rural, coastal and urban locations of the Bay of Plenty enabled a good assessment of whether different areas of the region might regard natural hazard risk differently. Targeting specific individuals with knowledge of the interests and concerns of stakeholders who might not be present at general community meetings (the 'invited parties' session – (Table 4)) ensured that these voices were also part of the process. Notably the facilitation team for the BOPRC engagement on risk found the "invited parties" meeting was very productive and would have liked to run more if resources and time had allowed.

Ultimately the process engaged the public imagination to a surprisingly and encouragingly high degree around a difficult topic. It enabled participants to think about risk from a range of hazard events, and to consider the implications for themselves personally, as well as for the community as a whole.

4.2   A VALID INTERPRETATION OF THE PUBLIC FEEDBACK

As with all public consultation or engagement processes it is very important to be clear and honest in representing what communities have expressed in the decision making process. In a process like this, where countable results have been collected from individuals (e.g., 20% of people say "X") it could be tempting to treat the process as a survey and add up the numbers. However, since this process relied on good and thoughtful feedback – and by necessity did not include large numbers – it would not have been statistically meaningful to represent the results as a quantitative assessment of the people of the Bay of Plenty region. This would be a fundamental misuse of the methodology. In analysing and interpreting the responses from the "I can live with this" engagement process, consideration was given to how to read the messages from each individual, group and ultimately the collective whole. The analysis relied on all the feedback given at the meetings including the responses to the questions about local government involvement, verbal and written comments, as well as the facilitator's observations about what had occurred at the meetings. Coding of the individual and group responses into tables was particularly critical. The key that was developed specifically for the project included additional categories to create soft boundaries between acceptable, tolerable and intolerable (e.g., acceptable/tolerable or "tolerable/intolerable"). This was done to avoid the dramatic effect that small group numbers could have on the categories (e.g., one person shifting the overall group response from tolerable to acceptable).

The overall summary of the community response to the matrix was the primary means by which community views could be compared with the two other sources of feedback, which were GNS Science's technical opinion and the feedback from the Lifelines group. It was therefore critical that this summary be compiled with full and sensitive awareness of what occurred at each group.

In a process like the one used in the Bay of Plenty, it is important to be aware that if there was significant diversity in the responses (i.e., with some groups being clearly more concerned, or less concerned, about hazard risk than others), the overall feedback to the policy process should reflect that. This was not the case in the Bay of Plenty Region with only one group being observably (but not greatly) more risk averse than the community as a whole.

4.3 VALID AND TRANSPARENT INTEGRATION

The way in which feedback from communities and affected stakeholders is incorporated in the final decision is a third part of a robust public engagement for policy development (Figure 12). In the case of the BOPRC development of risk thresholds for the RPS, two key process elements ensured that this integration was both valid and transparent:

i.   Feedback from the community engagement process was reviewed alongside two other sources of information (GNS Science technical opinion, and the Bay of Plenty Lifelines group). The response to risk thresholds was recorded and reported in the same way for all three sources. The use of the scenario matrix in the community sessions as a way of recording responses, and the analysis of those responses to create a summary matrix, enabled a direct comparison between the sources.

ii.   A four step process was used in reviewing the response to risk thresholds from all three sources. This progressively identified areas of commonality and divergence between the sources. Where there was divergence the final judgement was recorded and reported as part of the formulation of staff recommendations on risk (BOPRC 2014C). These judgements showed how decisions were made and the weight given to different views.

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5.0   LEARNINGS FROM THE BOPRC APPROACH

This section reviews observations and learnings from the approach adopted in BOP.

5.1   PRACTICAL IMPLEMENTATION ISSUES

The team involved with BOPRC public engagement on risk learnt several things about the process they had used:

- **Make the most of the meetings:** There was a high level of engagement at the meetings and an appetite for discussion about a range of issues. There was often interesting feedback, specific to the local community that could not be used in a regional level process. Greater involvement of territorial authorities in the community sessions might have made better use of the opportunity to discuss these issues or take on board some of the messages. Guidance on good practice for public engagement, (e.g., Quality Planning & IAP2) acknowledges the value of ensuring that public engagement processes synchronise with other events, and are well integrated into related policy or planning work. Though it is often a challenge to match timing, valuable feedback – particularly about public views on local government's mandate to act on natural hazard management – was generated that was not necessarily followed up as the process lacked a channel for doing so.

- **Link with the city and district councils:** The initial strategic workshop looking into public engagement on risk had excellent participation of expertise from around the region, and territorial authorities. This was critical to providing a good grounding for the task. However, later feedback from the territorial authorities suggested the engagement process had not delivered all they had hoped. In a regional level process it is important that local agencies are aware of the possibilities and the limitations of the process, and are able to see where it can add value to their work.

- **Pilot process with small meetings first:** Some of the first community meetings had the largest numbers of participants. However, this was a novel process and required some fine-tuning. The facilitation team concluded that in doing a new approach like this it would be best to start with the smallest meetings first where it is easier to quickly make adjustments.

- **What would you do with a response that showed divergent views on risk?** The process used for getting public input on risk thresholds had the possibility that the responses from each of the groups could vary widely about ideas on risk. If this had occurred, it would not have been appropriate to simply average out the response[17]. Rather it might be necessary to investigate this difference further, and to find a way to acknowledge the divergence in the final decision. It is important to be prepared for this potential extra step in the policy process. In the BOPRC process different groups did exhibit different responses, although they shared more in common. It is conceivable that a region might have "hot spots" of concern and a way to deal with this at a local and regional level should be included in planning for the project.

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[17] For example - if 50% of people prefer white cars and 50% of people prefer black cars – the most popular colour car is not grey!

5.2 LIMITATIONS AND OPPORTUNITIES

- **Is bigger better?** In developing policy or making a decision that affects a whole community, it is understandable that professionals should seek the comfort of big numbers. It is reassuring to know that a majority of a community support a particular viewpoint. However, this can also be a kind of hypochondria about numbers. Quantitative assessment, particularly within the budgets of most local government policy and planning initiatives, almost always requires a sacrifice of context and meaning. In selecting the method used to gain public input into the thresholds of acceptable risk in the Bay of Plenty, the BOPRC favoured more intensive community sessions over a survey as they recognised the need for participants to have the opportunity to develop a considered opinion.

  The resulting feedback from these sessions "gave a feel for the community's tolerance to risk" – the goal established by the initial project workshop. Moreover it was in keeping with the task i.e. a consultation with affected citizens to contribute to policy development. Other opportunities to contribute and respond to the RPS have not been compromised by this process.

  Nevertheless, it would be possible to upscale the community sessions, creating more opportunities for public input.

- **A national picture of risk acceptability**. An overview of the trends in the public response to risk in the BOPRC public engagement exercise showed participants were more impacted by the fear of bad consequences than by greater possibility that an event would happen. That is, they were less willing to take a chance on bad things happening, as they were better able to visualise what those bad things might be. This suggests the process revealed something about tolerance to natural hazard risk that interpretations based on likelihood or return period alone do not. The BOPRC approach to public engagement on risk provides an interesting basis for work that could be undertaken at a national level.

  From this case study, those involved in planning (i.e. large scale developers and planners within council), for both the future development of communities and the safeguarding of them from natural hazard events, would appreciate stronger national guidance around risk acceptability. Measures – such as the public view on the road death and injury toll – is one example of risk tolerance, and can provide some guidance. In the case of the road toll, New Zealand public accept the value of road transport but have given a strong social contract to government to actively reduce the risks associated with this (e.g., improved roads). However, natural hazard impacts extend far beyond life loss. National direction which takes into account the expectations of the public around the remit for government and local government in safeguarding communities from natural hazard events could be beneficial. It could include the consequences across multiple areas including social, economic and infrastructural impacts.

- **Integrating land use planning and emergency management**. Since developing levels of risk for the RPS, the BOP Civil Defence Emergency Management Group has adopted the consequence table to inform their risk assessments for natural hazards. This provides good integration between land use planning and emergency management response planning, as the risks are being assessed in a consistent manner between land use – to reduce risks – and emergency management readiness and response for when events overwhelm the land use.

Key points on the BOPRC public engagement on risk

The engagement process undertaken in the BOP met the BOPRC's need to get an indication of community views on natural hazard risk. It engaged the public imagination around a difficult topic and produced a response that could be evaluated alongside technical input on risk thresholds integrated into the final decisions in Variation 2 (natural hazards) of the BOPRC PRPS. There were several key points that contributed to this:

i.   The process was based on good public engagement practice (as recommended by such authorities as IAP2 and guidance from Quality Planning). It was also specifically designed to meet some of the unique challenges of communication on risk, particularly the need for enagement processes that:

-   build capacity for judgment by providing a means for people to understand complex risk concepts; consider the implications for themselves and their community; and enable them to realistically reflect on both the consequences and likelihood of natural hazard events before making decisions about risk acceptability.

-   link judgements on risk acceptability to implications for local government policy or action.

ii. Core elements of the process were:

-   Good interdisciplinary effort, particularly the initial project scoping workshop which combined skills from planning and policy, community development, Māori liaison and communication from regional, city and district agencies.

-   Use of the risk-based planning framework and the resources provided in the Risk-Based Planning Approach toolkit from GNS Science. This was supported by the associated use of a consultant experienced with the RBPA, social research, and risk engagement methodologies.

-   Design of community sessions that combined the semi-structured approach of focus group methodology with public meeting design and took people through a five step process of developing understanding and making judgments. Use of "interested parties" sessions to capture views not always represented in public forums was particularly valuable and could be more widely used.

-   The use of the "I can live with this" scenario matrix to capture participant's views on risk acceptability across all natural hazards, and enabled them to consider both the likelihood and consequences of events in making their judgements.

-   Careful and sensitive analysis of the participant's responses, utilising all the feedback from the meetings to generate a summary overview of community views on risk thresholds.

-   A four step process to review and compare the community response with other technical views on risk thresholds and clarity around how judgement calls were made.

-   This was an adaptive approach and there was opportunity for the project team to reflect on the process, and amend where necessary.

Overall the BOPRC public engagement on risk was a robust contribution to the development of policy. It met criteria for valid process, valid interpretation, and valid and transparent integration into the final decision. It produced new insight beyond the limits of traditional consultation over policy alternatives. Moreover it facilitated public and stakeholder input into an early stage of the policy planning process – contributing to the development of the decision.

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6.0 APPLICATION FOR WELLINGTON REGION

Wellington, like the Bay of Plenty, is a region where geology, geography and human activities combine to present a high susceptibility to natural hazard events. These include earthquake, flood, tsunami, extreme storms as well as the likely future effects from sea level rise and increased coastal erosion. Wellington City is the seat of government as well as the third largest urban centre in the country, and impacts on the capital city will be felt throughout the country. Across the Wellington region there are many smaller settlements that, in addition to potential loss of life and home for individuals, may face isolation and economic hardship in the event of damage to infrastructure from a natural hazard event.

Local government agencies at regional and territorial levels are grappling with many planning and policy development challenges. For the management of natural hazards, they require a clear mandate from the public on the levels of risk that are acceptable, and what actions they support to avoid, mitigate or reduce hazard impacts from occurring.

In Table 12 we review some of the planning and policy development opportunities in the Wellington region. These examples are where the kind of methods employed in the BOPRC public engagement on risk thresholds could be utilised to support decisions on risk management or land use planning, that takes into account natural hazard risk. In offering these ideas we are aware that well considered public engagement on many of these initiatives is ongoing, and it is not implied that these ideas should supplant those activities underway, but rather have the potential to add value in the future.

Table 12 Examples of opportunities to apply an engagement process on levels of risk for natural hazard and risk management in the Wellington region.

Opportunity	Example	How the engagement process would be useful
Flood protection works	Proposed Hutt River flood protection works, led by Greater Wellington Regional Council.	Engaging with the community on levels of flood risk with and without proposed protection measures.
Climate change adaptation policies	Drafting and implementation of the proposed Wellington Regional Climate Change Strategy (http://haveyoursay.gw.govt.nz/climate-change)	Increasing the community's understanding of climate change impacts, and assessment of community acceptability of adaptation options at different trigger points.
District plan reviews	Proposed review of the Hutt City Plan's natural hazard chapter.	Assess levels of risks that are acceptable, tolerable and intolerable, and incorporate these levels of risk into the review of the natural hazards chapter of the Hutt City Plan.
Long Term Plans	Cost/benefits of hazard mitigation and risk reduction activities, both at regional and district level.	To assess what the community is willing to live with before needing to financially contribute to risk reduction measures.
Growth strategies	Wellington Regional Strategy (http://www.gw.govt.nz/wellington-regional-strategy-2/) (focus on economic growth)	Can include the community's level of acceptability for the benefits and costs of growth versus natural hazard mitigation and risk reduction.

Opportunity	Example	How the engagement process would be useful
Structure plans	Maymorn Structure Plan, Upper Hutt	Involving the community early in the structure plan development process to assess the level of flood risk they are willing to live with as the area develops.
Strategic/community development plans	Wellington Region Natural Hazards Management Strategy	Assess and incorporate community priorities for natural hazard, research, mitigation, and risk reduction activities.
CDEM community response planning	Proposed Hutt Central community response plan development process	Will assist in community members understanding and visualising the natural hazard risks in the central Hutt area to prepare for their response. May provide an opportunity for members to assess current land use i.e. whether it is acceptable.

In addition to the forward planning processes listed in Table 12, we are aware that some coastal regions around New Zealand are already beginning to consider the long term viability of particular coastal settlements as increased flooding, higher tides and coastal erosion take their toll. Decisions about what to do for existing communities, where people already have substantial investment, requires direct discussion between affected parties and agencies. It can be expected to be lengthy, with many stages in which both community and agency build their understanding of the options and way forward. Being able to clearly understand the risk and in particular being able to see both consequence and likelihood within that (as occurred in the BOPRC public engagement on risk), could be useful to this process, albeit only part of a larger conversation. An example of this kind of public engagement on hazard impact on an existing settlement is the Western Bay of Plenty District Council "storm in a teacup" process (http://haveyoursay.westernbay.govt.nz/storm-in-a-teacup).

7.0 CONCLUSIONS

There is a growing demand for local government to engage with their communities on a range of issues associated with natural hazards. This includes situations where new hazards – or hazards of increasing impact – threaten existing settlements, or where public opinion on what risks can be accepted is an important part of decisions about future land use.

The "I can live with this" public engagement on risk, undertaken by the BOPRC, facilitated community and stakeholder involvement in the regional planning process, specifically around the question of what was an acceptable, tolerable or intolerable natural hazard risk. The process met the BOPRC's need to get an indication of community views on natural hazard risk. It engaged the public imagination around a complex issue, and produced an informed response that could be evaluated alongside technical input on risk thresholds and integrated into the final decisions in Variation 2 (natural hazards) of the BOPRC PRPS.

The BOPRC process was necessarily innovative – given that both risk-based planning and talking to communities about future risk are emergent practices in local government. It was subject to the usual time and resource constraints of all planning initiatives. However, it was able to utilise skills from local government agencies around the region, and resources from the GNS Science risk-based planning approach toolkit. This allowed the process to be tailored to ensure it was both locally relevant and responsive to national and international good practice for public participation in policy development. In particular, it met some of the unique challenges associated with talking about thresholds for risk acceptability. The task is not an easy one – essentially to create clean lines around ambiguous concepts. This requires a particular set of guiding principles. Central to the challenge of risk engagement for public policy development is the need to:

i.   Design a process that builds capacity for judgment by providing a means for people to understand complex risk concepts; consider the implications for themselves and their community; and enable them to realistically reflect on both the consequences and likelihood of natural hazard events before making decisions about risk acceptability.

ii.   Link judgements on risk acceptability directly to implications for local government policy and action.

Given the significance of the thresholds for acceptability to the entire risk-based approach to natural hazards within the BOPRC PRPS, and the novelty of including public input at this stage in the hazards policy development process, robustness was a constant concern to the project team. The BOPRC public engagement process on risk met criteria for valid process, valid interpretation, and valid and transparent integration into the final decisions. It produced new insight beyond the limits of traditional consultation over policy alternatives. Moreover, it facilitated public and stakeholder input into an early stage of the policy planning process – contributing to the development of the decision.

We believe the framework and ideas employed in the Bay of Plenty engagement on risk would be useful to planning and policy development in regions such as Wellington, which is equally subject to potential impacts from multiple natural hazards. Opportunities include district plans, CDEM risk assessment and response plans, long term plans, growth strategies and other situations that would benefit from a way to incorporate considered public input on the level of acceptability of the risk for the benefits of development.

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8.0   ACKNOWLEDGEMENTS

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APPENDICES

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A1.0 APPENDIX 1: PRESENTATION MATERIALS USED IN COMMUNITY SESSIONS

We aim to….

- to get your input on what level of natural hazard risk you want your community to be safeguarded from

    (not about specific details like how a tsunami might affect your house)

- yours is one of eleven sessions we are running around BOP

Session outline

Three parts:

Introduction - what IS natural hazard risk and how might it effect us in the Bay of Plenty – or "what are the chances?"

Part 1 - what do you expect from your local councils?

Part 2 - I can live with this – your view on what risks are acceptable or not.

Background

- *The Bay of Plenty has the widest range of natural hazards in New Zealand*

- *Councils want to reduce the harm to communities*


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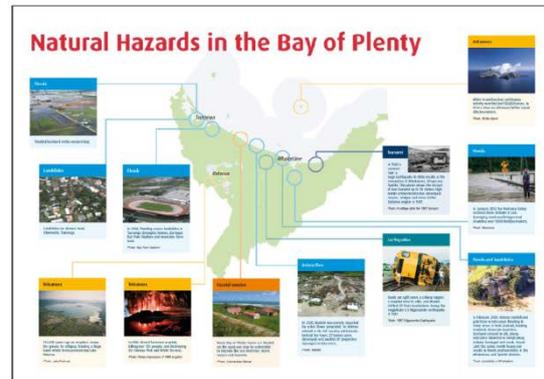
So what's it all about.....

- *Natural hazards policy that will guide district and city plan rules that influence where people live and work, and how they develop land and infrastructure*

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To do this we...

- *include rules within formal policies and plans*
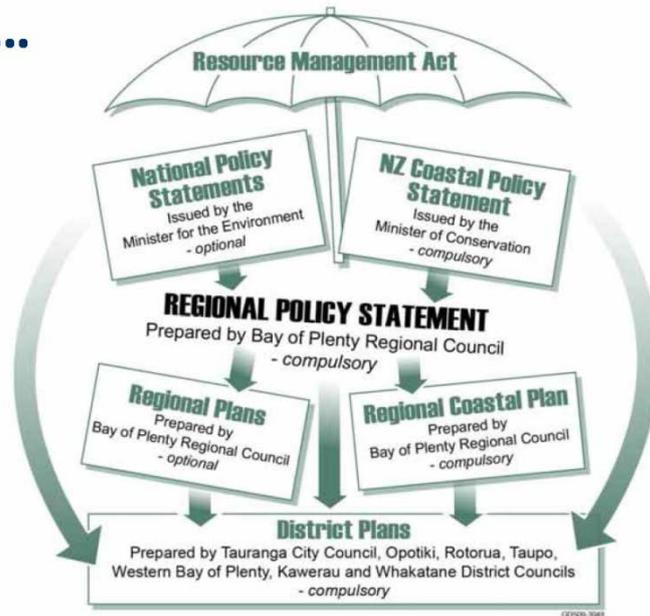
Part of the challenge of risk reduction is
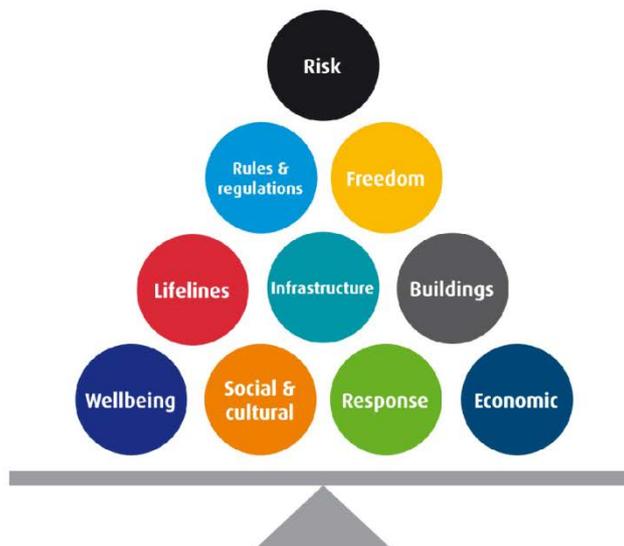
Your input will…..

- *help the Regional Council find this balance*

safeguarding what is important to communities and allowing for the freedom to improve and develop the places where we live, work and play

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So …a natural hazard risk

When is it

- **acceptable** - *part of daily life - these things happen*
- **tolerable** - *when it's awful but you know that your family and the community can recover from it in time*
- **intolerable** - *NO WAY - risk is so great that it can't be justified*

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Part One

- *We aim to explore two areas – firstly we will look at your opinion on our Councils responsibility in managing the potential consequences of natural hazard events*

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Let's go to the questionnaire….

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- **What do you think Councils should be responsible for?**

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1. I expect regional and local councils to take action to reduce the possible consequences of a major natural hazard event.

2. It is important to me that regional and local councils take action to safeguard both privately owned assets, as well as publicly owned community assets.

3. I expect all our councils to take a long-term view using the most recent information available.

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4. Councils should stick to providing information about natural hazard risks and leave people to decide for themselves if it is acceptable or not.

5. If a council allows people to knowingly choose to take on a risk themselves, council rates should be available to compensate those who suffer loss.

6. It is important that Councils do restrict activities now for low likelihood natural hazard events (may not occur for a long time).

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Part two

- **acceptable** - *part of daily life - these things happen*

✔ **tolerable** - *when it's awful but you know that your family and the community can recover from it in time*

✘ **intolerable** - *NO WAY - risk is so great that it can't be justified*

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Living with risk

HIGH RISK

RISK

LOW RISK

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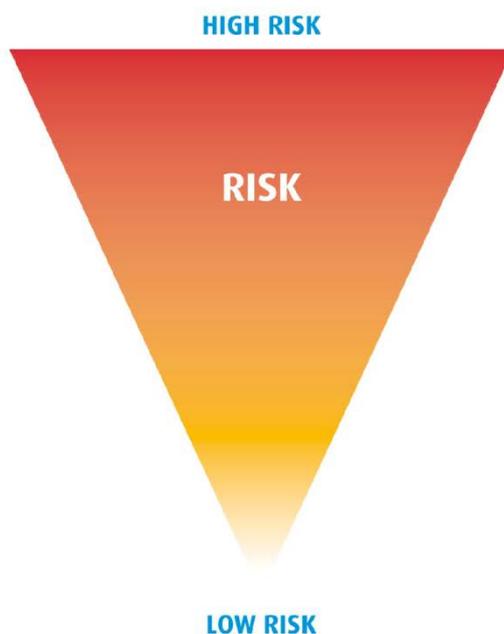
Levels of risk:
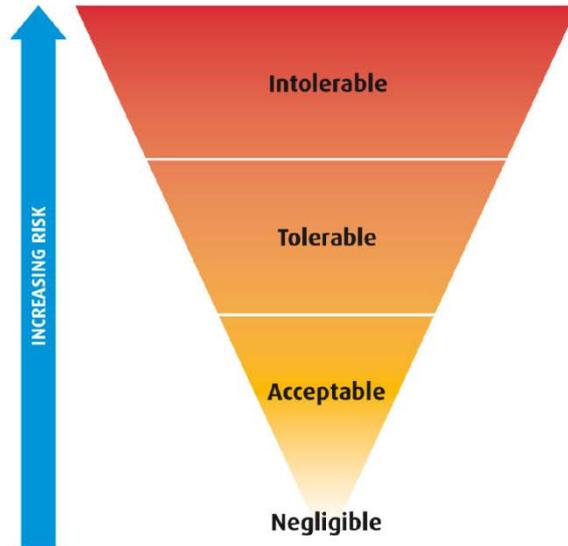
If the community says the risk is:
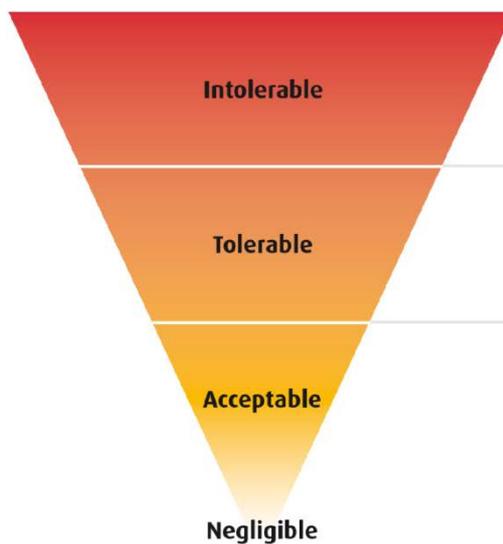
Then, in our policies:

Intolerable — Risk must be reduced

Tolerable — Where existing risk has been identified, the risk needs to be reduced to as low as practicable

Acceptable — Any risk associated with new activities needs to be within the acceptable range

Negligible

Where do the risk thresholds lie?
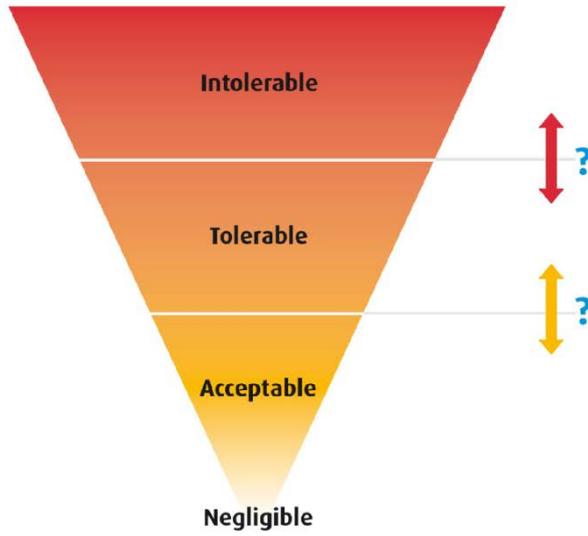
Where do the risk thresholds lie for other factors?
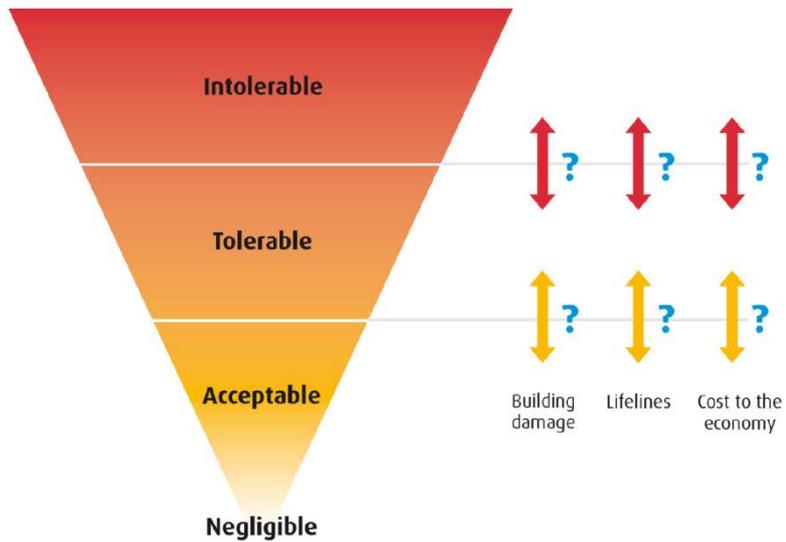
In determining this we need to...

- consider the _likelihood_ that a hazard event will happen and the impact or _consequences_ if it does

e.g. knowing that a building may flood BUT only rarely may be acceptable.

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Before we take that risk...

- _we have to weigh up_

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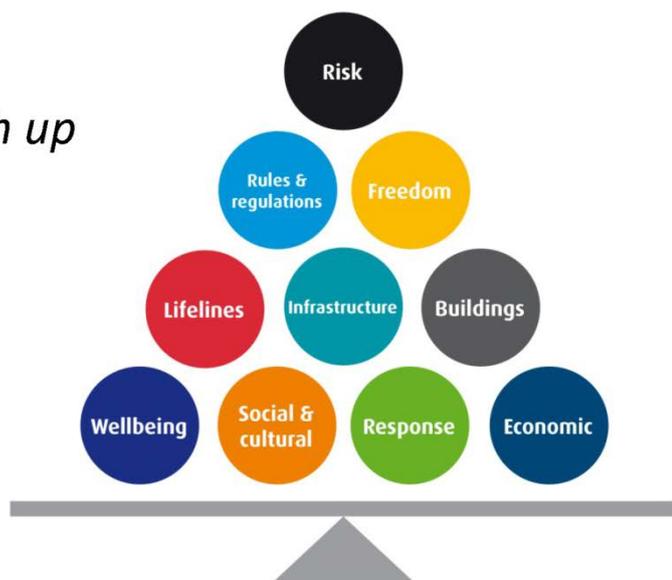
What risk do you want to live with?

- **acceptable** - part of daily life - these things happen
- **tolerable** - when it's awful but you know that your family and the community can recover from it in time
- **intolerable** - NO WAY - risk is so great that it can't be justified

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I can live with this risk...

- put your lucky number in top right hand corner
- we will talk the process through before you start

Think of an event that could happen in your community then apply this image when working through this table - read the scenario then scroll across the page and mark your thoughts in each space using the symbols as per below:

- *Acceptable - this is part of life that I could put up with*
- *Tolerable - my family and community could recover in time if we had to*
- *Intolerable - NO WAY - this risk is too great. It can't be justified*

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	Likelihood				
	Once every 50 years (Likely)	Once every 100 years (Possible)	Once every 100-1000 years (Unlikely)	Once every 1000-2500 years (Rare)	More than 2,500 years (Very Rare)
	90% chance for me	80 - 90% chance for me	15-80% chance in my and my grandchild's lifetime	5-15% chance in my and my grandchild's lifetime	Less than 5% chance in my and my grandchild's lifetime
(V) The natural event is catastrophic. Nearly half of the liveable homes are wiped out. Some can be rebuilt but many can never return. One quarter of hospitals/marae etc have been badly damaged and are unable to be safely used. Many are beyond repair. It kills over 100 people. Businesses and livelihoods are lost. [up to 10% GDP or annual income]					
(IV) Up to a quarter of schools, hospitals and marae have been damaged (and are struggling to function). Half of the homes in your community have been damaged, some of those can be rebuilt but many can't. It may take up to six months to fix the water and roads. Over 10 people died with more than 100 injured. About 20% of the town centre will be closed off for anything from a week to a month. [10% of GDP or annual income]					
(III) In your community of 1,000 homes about 60 - 100 houses are unliveable, the natural event knocks out power and water networks. For a week daily life revolves around getting bottled water and queuing up at the portaloos. Some businesses can't open. The natural event injures up to 100 people. [1% of GDP or annual income]					
(II) This event has affected 20 - 100 houses in your community of 1,000, with the local marae and school out of action for up to a day and the town centre is closed briefly. The hospital is able to function but has some damage. You may need to use a bucket for the toilet for the day. No-one died but 10 people were injured.					
(I) You have had a big fright from this event but basically there has been no real damage and the local shops were only closed for a couple of hours. No-one was injured.					

(left margin label: Consequences)

Likelihood

Once every 50 years (Likely)	Once every 100 years (Possible)	Once every 100-1000 years (Unlikely)	Once every 1000-2500 years (Rare)	More than 2,500 years (Very Rare)
90% chance for me	80 - 90% chance for me	15-80% chance in my and my grandchild's lifetime	5-15% chance in my and my grandchild's lifetime	Less than 5% chance in my and my grandchild's lifetime

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Consequences	(V) The natural event is catastrophic. Nearly half of the liveable homes are wiped out. Some can be rebuilt but many can never return. One quarter of hospitals/marae etc have been badly damaged and are unable to be safely used. Many are beyond repair. It kills over 100 people. Businesses and livelihoods are lost. [up to 10% GDP or annual income]
	(IV) Up to a quarter of schools, hospitals and marae have been damaged (and are struggling to function). Half of the homes in your community have been damaged, some of those can be rebuilt but many can't. It may take up to six months to fix the water and roads. Over 10 people died with more than 100 injured. About 20% of the town centre will be closed off for anything from a week to a month. [10% of GDP or annual income]
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	(II) This event has affected 20 - 100 houses in your community of 1,000, with the local marae and school out of action for up to a day and the town centre is closed briefly. The hospital is able to function but has some damage. You may need to use a bucket for the toilet for the day. No-one died but 10 people were injured.
	(I) You have had a big fright from this event but basically there has been no real damage and the local shops were only closed for a couple of hours. No-one was injured.

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Checking in….

Living with risk

Proposed Regional Policy Statement
Preparation of Variation 2 (Natural Hazards)

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Here is a second chance….

- *Has anything changed for you – based on this session and the discussions?*

- *Consider the answers you gave initially and if you want to change your response - use the red coloured pen*
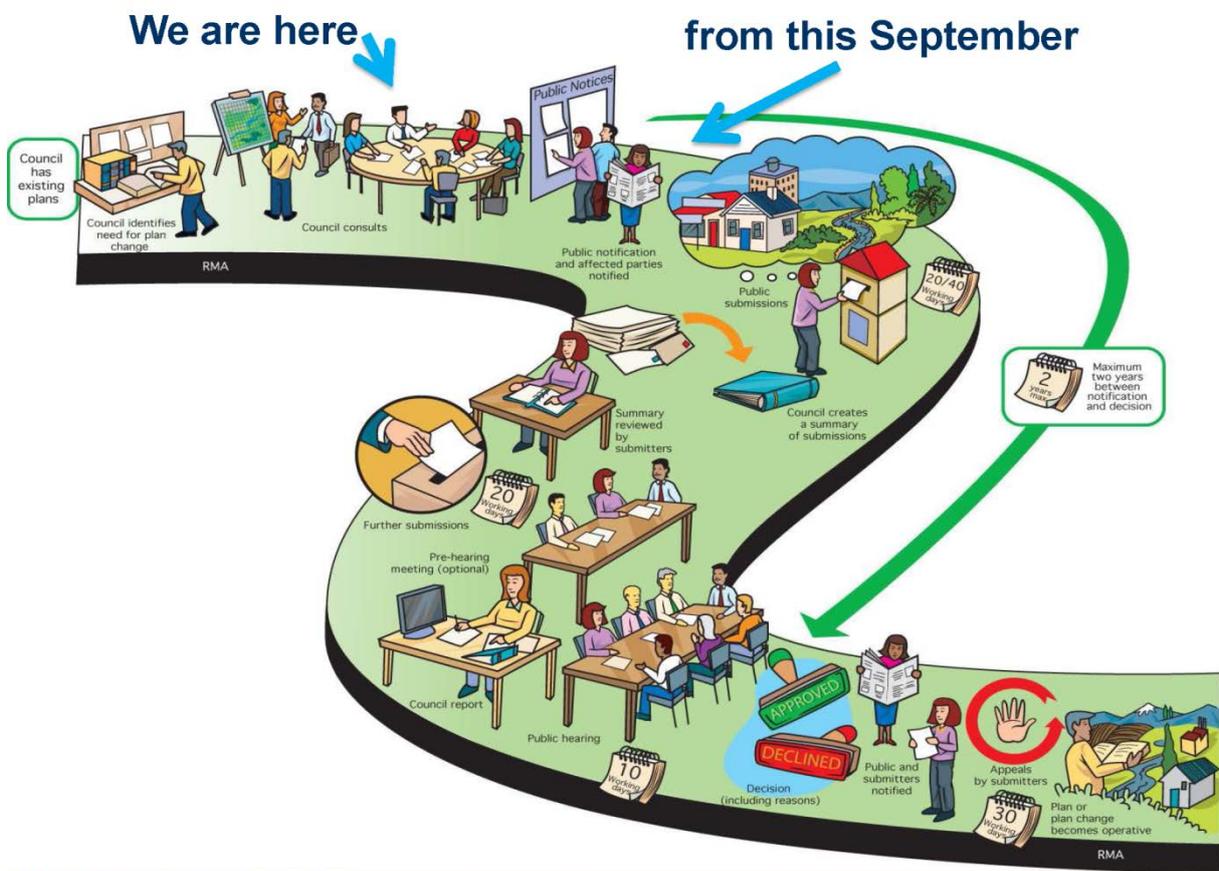
Just checking....

- Did you change any of your answers/thinking?

- Did anything change for you on what Councils should/should not do?

- Do you feel comfortable that your opinions will help direct Council's RPS natural hazards policy?

- Are there any ways you think we can improve this session?

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http://www.getthru.govt.nz/

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Thanks....

- and the spot prizes go to....

- any further questions feel free to stay on
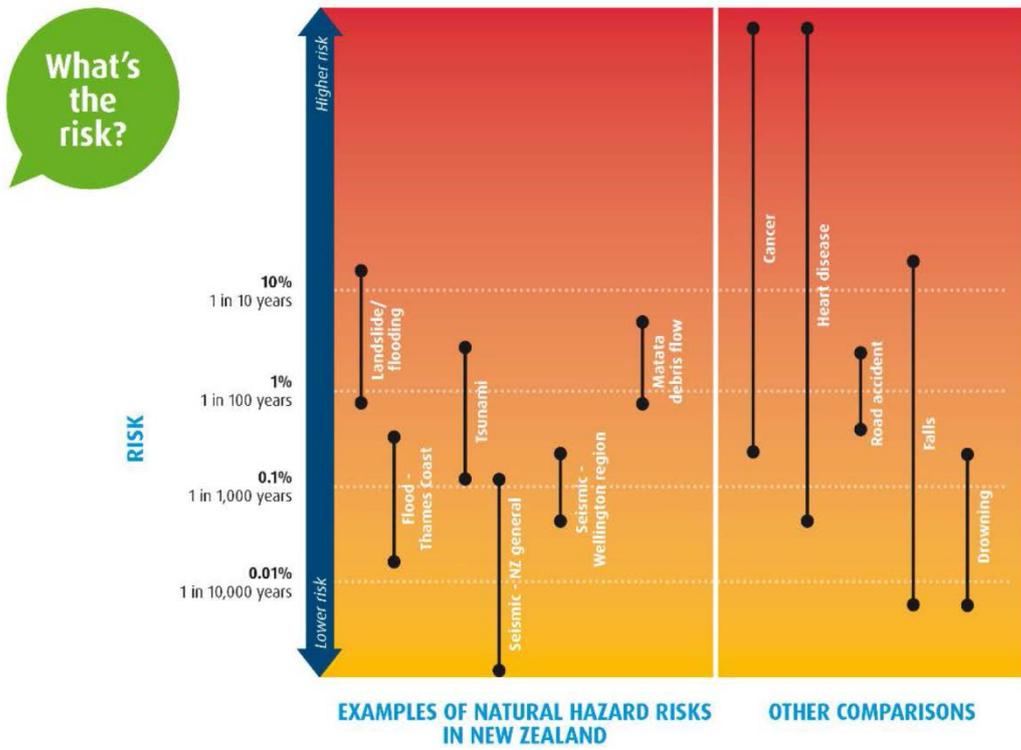
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What do you think Councils should be responsible for?

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I am ☐ Male ☐ Female ☐ *Māori* ☐ *NZ European* ☐ *Pacific Islander* ☐ *Other*

☐ *rural* ☐ *urban* ☐ coastal ☐ Employed ☐ Unemployed ☐ Self-employed ☐ Retired

and my age bracket is:

☐ less than 20 years ☐ 20–30 years ☐ 31–40 years ☐ 41–50 years
☐ 51–60 years ☐ 61–70 years ☐ 71–80 years ☐ 81-90+ years

1 I expect regional and local councils to take action to reduce the possible consequences of a major natural hazard event (e.g. by setting rules to control where and how new development/roading/infrastructure occurs).

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why? ....

....

2 It is important to me that regional and local councils take action to safeguard both privately owned assets (e.g. homes, farms and other businesses) as well as publicly owned community assets e.g., (schools, hospitals, roads, water and waste services).

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why? ....

....

3 I expect all our councils to take a long-term view using the most recent information available (e.g. by setting rules to control how new development occurs). Policy reviews should include the latest information about natural hazard risks.

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why?..

....

4 Councils should stick to providing information about natural hazard risks and leave people to decide for themselves if it is acceptable or not.

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why?..

....

5 If a council allows people to knowingly choose to take on a risk themselves, council rates should be available to compensate those who suffer loss.

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why? ....

....

6 It is important that Councils do restrict activities now for low likelihood natural hazard events (may not occur for a long time).

☐ Strongly agree ☐ Slightly agree ☐ No opinion ☐ Slightly disagree ☐ Strongly disagree

Why? ....

....